

# California Hospital Outcomes Project



## Heart Attack Outcomes 1996 -1998 *Volume 1: User's Guide*

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**2002**

*"Equitable Healthcare  
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# **Report on Heart Attack Outcomes in California, 1996-1998**

## **Office of Statewide Health Planning and Development**

### **California Hospital Outcomes Project**

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## Report on Heart Attack Outcomes in California: 1996-1998

*The California Hospital Outcomes Project is an initiative mandated by the State of California, and conducted by the Office of Statewide Health Planning and Development (OSHPD), to develop public reports comparing hospital outcomes for selected conditions treated in hospitals throughout the state.*

*The Report on Heart Attack Outcomes is intended to encourage all California hospitals to improve their care and give credit to the hospitals that are the leaders. It can also help insurers, employers, and consumers to select hospitals based on quality of care.*

### The California Hospital Outcomes Project

Heart attack (acute myocardial infarction or AMI) was chosen as one of the first conditions to be reported upon by the California Hospital Outcomes Project because it is important, common, and deadly. Every year approximately 40,000 heart attack patients are admitted to 400 California hospitals. More than 5,000 of these persons die.

The mortality rates published in previous heart attack reports have been used in many ways. Hospitals have used their results to evaluate and improve their quality of care. Payers and providers have used the reports to contract with the best hospitals. Consumers have used the reports to inform their decisions.

The results published in this report are useful because:

- **They have been risk-adjusted.** Patient age, sex, type of heart attack, and chronic diseases were used to adjust for differences in patient risk when calculating hospital mortality rates.
- **They have been validated.** A major validation study involving nearly 1,000 heart attacks at 30 hospitals showed that variations in how hospitals report their data to OSHPD do not significantly affect their risk-adjusted death rates. In general, low-mortality hospitals treat heart attacks more aggressively than high-mortality hospitals.

### Content of the Report on Heart Attack Outcomes

This report is the most recent in a series that began in 1993. This report includes heart attack cases from 1996 through 1998. It incorporates improvements in the risk-adjustment methodology introduced in previous reports, including:

- linking with Vital Statistics records to identify deaths occurring outside the hospital;
- refining patient risk factor definitions based on the findings of the validation study published in 1996; and
- using six months of pre-heart attack hospital records to more completely describe patient risk factors.

This report consists of four volumes:

The **User's Guide** (Volume 1) is intended for everyone interested in hospital performance, including hospital staff, employers, government agencies, health plans, insurance companies, and individual consumers. This volume provides a brief description of the study background and methods. It also contains two tables that display the results for individual hospitals based on heart attacks that occurred between 1996 and 1998.

The **Technical Guide** (Volume 2) is intended for health services researchers, health care providers, and others interested in the statistical methods used to calculate risk-adjusted death rates.

The **Detailed Statistical Results** (Volume 3) contains the numerical results for individual hospitals upon which the classifications in the *User's Guide* are based. In addition, there are tables that aggregate the results to the county level. It also contains a graphical representation of both individual hospital and county-wide results, which can be used to examine annual trends.

The **Hospital Comment Letters** (Volume 4) is intended to give readers of the *Report on Heart Attack* an appreciation of its strengths and weaknesses from the hospitals' perspectives.

To obtain these volumes of the report contact:

Office of Statewide Health Planning and Development  
Healthcare Information Resource Center  
818 K Street, Room 500  
Sacramento, CA 95814  
(916) 322-2814

The report volumes are also available on the internet at  
<http://www.oshpd.state.ca.us>

Hospitals were provided with a *Hospital Guide to Using the Report Data* several weeks before the *Report on Heart Attack Outcomes* was published. This document accompanied each hospital's patient-specific data. Hospitals used this document to access and use their patient-specific data and to prepare their comment letters, provided in Volume 4. More importantly, hospitals and their physicians can use this information to target areas where heart attack care might be improved.

## Section

# 1

## Using this *Guide*

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*The User's Guide of the Report on Heart Attack Outcomes is intended for all those interested in hospital performance for heart attack care. These may be hospital staff, employers, government agencies, health plans, insurance companies, other health care purchasers and payers, as well as individual consumers.*

### Hospitals

The *Report on Heart Attack Outcomes* compares heart attack mortality rates for all California hospitals after adjusting for differences in patients' age, sex, and physical health. One of the primary purposes of the report is to improve the quality of heart attack care in **all** California hospitals by encouraging members of the medical and nursing administrative staff and other hospital staff to incorporate this information into their quality management activities.

Use the information in this volume, which summarizes the risk-adjustment methodology and results, as a starting point. Use the graphs to compare your risk-adjusted mortality rates with the statewide benchmark. Examine the *Detailed Statistical Results* to compare your expected mortality rate with your actual mortality rate. Evaluate your hospital's performance along with the performance of other hospitals.

Use the information in the *Technical Guide* and *Hospital Guide to Using the Report Data* to target areas for potential improvement. For example, you may want to analyze the risk-adjusted mortality rates in your hospital after a change in cardiac care protocols. After quality improvement interventions have been implemented, use the information in this report to help determine if those interventions have been successful.

### Employers and Health Care Purchasers

The information in this report can be useful in your interactions with both health insurance organizations and employees. Use this information, along with the information in the other volumes of this report, to help select and negotiate with insurance carriers on behalf of your employees. Share this information with your employees to help them select a health plan.

This report examines only one dimension of hospital quality; it is not a comprehensive measure of overall quality. No such single measure exists. Other organizations, some of which are listed in the Appendix to this volume, monitor different aspects of health care quality. Information from these organizations can be used to augment the results published in this report.

## Government Agencies

The information in this and the other volumes of the *Report on Heart Attack Outcomes* can be useful to state and county agencies involved in arranging care for program beneficiaries. The results can be used in selecting hospitals and in negotiating with managed care organizations.

This report provides information on only one aspect of the quality of care at a particular hospital: the care of patients with heart attacks. It does not address the quality of care for any other condition and should not be used as a general measure of hospital quality.

## Health Plans and Health Care Payers

The information contained in the *Report on Heart Attack Outcomes* can help you select hospitals to provide services to your beneficiaries. For example, one large California insurer contacted all of its contracted hospitals to ask how they used their heart attack mortality rates to improve the quality of patient care. Even though the published rates are several years old, a hospital's response can indicate something about its commitment to quality.

You may find it helpful to read the other volumes of the *Report on Heart Attack Outcomes*. The *Technical Guide* will help you understand exactly how the study was done and how the results were calculated. The *Detailed Statistical Results* contains the exact numerical values upon which the results in this volume are based. It also presents graphs of each hospital's annual results.

Remember that this report examines a single dimension of hospital quality and should not be used to evaluate the quality of any hospital services other than heart attack care. Use information from other organizations to augment the findings of this report.

## Individuals

This report can help you make more informed health care decisions.

Discuss this information with your family members, physician, health plan, or employer to understand the choices you have in hospital care.

Each year 900,000 people in the United States suffer a heart attack. Approximately 225,000 die. About half of these people die before they get to a hospital. The key to surviving a heart attack is getting to the hospital to begin treatment as quickly as possible.

Use this information now to prepare yourself in the event that you or someone you know suffers a heart attack. Look at the hospitals you might use in the event of a heart attack.

- If you believe you could be suffering from a heart attack, do not be embarrassed to go to the hospital: Do not wait to seek care.
- Do not ignore or deny symptoms.
- **The most common symptom of a heart attack is a vise-like pressure in the chest. Pain in the neck, shoulders or arms may also occur<sup>1</sup>.**

A recent nationwide study of 434,877 patients from 1,674 hospitals reported in the *Journal of the American Medical Association*<sup>2</sup> concluded that one-third of men and women who have heart attacks do not experience chest pain. People who experienced painless heart attacks had considerable delays in seeking care and were less likely to receive important therapies. Because of this, they were much more likely to die in the hospital compared to heart attack patients with chest pain.

- Women and the elderly are more likely than others to experience painless heart attacks.
- **Extreme shortness of breath may be the symptom of a painless heart attack. Nausea, profuse sweating, indigestion that gets worse while walking, and a sense of doom may also occur.**

<sup>1</sup> See the American Heart Association's website at [www.americanheart.org/warning.html](http://www.americanheart.org/warning.html)

<sup>2</sup> John G. Canto, et al, "Prevalence, Clinical Characteristics, and Mortality Among Patients With Myocardial Infarction Presenting Without Chest Pain", JAMA, June 28, 2000, vol. 283, no. 24, pps 3223-3229.

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## Evaluating Hospital Quality

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*Although this report focuses on outcomes, there are many ways of measuring health care quality. No single method is universally accepted as superior. However, some methods are better suited to answering specific types of questions.*

### Measuring Health Care Quality

Quality is often measured simply by asking patients if they find care satisfactory. The difficulty with this type of evaluation is that patients have very little clinical information upon which to base their judgments. **Patient satisfaction** may be a result of such things as personal interactions with physicians and nurses, the appearance of the facilities, and other factors not necessarily indicative of medical expertise or clinical quality.

One of the most common ways of evaluating health care quality is to examine the hospital's staff, equipment, and facilities. These attributes are called the **structure of care**. For example, one might look at staff credentials, staff-to-patient ratios, or the availability of specialized services. Although these characteristics are important and easy to measure, they tell more about the care patients *might* receive than the care patients *actually* receive.

Some quality assessment techniques do directly measure the care that is received. This approach evaluates the **process of care**, which includes such things as diagnostic accuracy and the appropriate use of drugs, tests, or treatments. This type of quality evaluation can be particularly useful to doctors, nurses, and hospitals even though the most appropriate care is not always easily defined or agreed upon. Process of care measures can be controversial, and also difficult for non-clinicians to interpret.

All of the above methods fall short of answering the question that is most important to patients — “Which hospital or doctor is most likely to make me better?” Answering this question requires measuring the **outcome of care**. Positive outcomes, such as improved health or improved ability to do everyday tasks, are common but are also subjective and difficult to measure. Adverse outcomes, such as illnesses that develop during a hospital stay, disability, or death are much less frequent. The easiest adverse outcome to measure is death, but the others are also important to consider. Although measurement of outcomes seems to provide the most direct answers to questions about health care quality, it is perhaps the most difficult to measure.

## Risk-Adjusted Outcomes

Comparing hospitals on their outcomes is difficult because different hospitals treat different types of patients. Some hospitals treat patients who are older or sicker than those at other hospitals. A technique called **risk-adjustment** accounts for these differences in patient characteristics. **Risk factors** are the patient characteristics that might influence the outcome of medical care. For example, both female sex and a weak heart (from congestive heart disease) are risk factors associated with a significantly higher chance of dying from a heart attack.

Adjusting a hospital's outcome of care for risk is similar to crediting it for admitting higher risk patients and debiting it for admitting lower risk patients. In other words, to make comparisons among hospitals fair, each hospital's outcome is credited or debited depending on the presence or absence of various patient risk factors at admission.

In this report, we are evaluating death rates following heart attack. If one hospital receives older, sicker patients than another hospital, we would expect it to have more heart attack deaths. Adjusting for patient characteristics helps us to compare all hospitals with the statewide benchmark.

## Strengths and Weaknesses of Risk-Adjusted Outcomes Measurement

The most important strength of risk-adjusted outcomes measurement is that it attempts to answer the questions that are most relevant and understandable to health care purchasers and consumers. They have a right to know the value of the health care that they pay for. In seeking economical care, they need reassurance that they will not sacrifice quality of care.

Risk-adjusted outcomes measurement is useful to hospitals and physicians for targeting areas that need improvement. After the target areas are identified, hospitals and physicians need to know more about what they should do differently. For this reason, hospitals and physicians focus on the structure and process of care in their quality improvement activities. They can use risk-adjusted outcomes to help determine if these activities have been successful.

The principal weakness of evaluating quality based on risk-adjusted outcomes is that it is impossible to account for every risk factor that may influence a particular outcome. Thus, it is always possible that an adverse outcome was the result of unmeasured risk rather than poor hospital quality.

California is one of the few states attempting to measure health care quality. The methods and techniques for measuring outcomes are still in development and may occasionally result in the misclassification of an individual hospital. However, the methods used in this study have been

validated by reviewing approximately 1,000 medical records of heart attack patients throughout the state.

A primary objective of this report is to motivate all hospitals to take a closer look at the care they provide for heart attack patients. Experience in New York provides some evidence that this can happen. Since 1990, New York has published hospital mortality rates for heart bypass surgery. During the subsequent three years, its statewide mortality rate dropped from 4.17 % to 2.45 %, a decrease of 41 %.

### **FREQUENTLY ASKED QUESTIONS**

**Q: *What was the time period covered?***

A: Three years of data were included in the study: 1996, 1997, and 1998. Aggregate results are presented in this volume and annual results are presented in the *Detailed Statistical Results*.

**Q: *How many hospitals were included in the study?***

A: 1996: 380 hospitals

1997: 373 hospitals

1998: 371 hospitals

Overall: 398 different hospitals were included for at least one of the years

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## Measuring Heart Attack Mortality

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*This heart attack study calculates the percent of hospital patients who died within 30 days following hospital admission for a heart attack. It compares the death rates among California hospitals after considering the fact that different patients have different chances of dying due to individual risk factors.*

### Data Sources

The data used in this analysis came from two different sources: the California Hospital Discharge data set collected by OSHPD and the California Vital Statistics data base maintained by the California Department of Health Services. The discharge database was used to identify heart attack patients and their risk of mortality. The vital statistics database was used to determine which patients died within 30 days of suffering a heart attack.

The discharge database contains information on all patients admitted to non-federal California hospitals. It includes patient demographic data such as age, race, and zip code of residence, and hospitalization data such as length of stay and total charges, as well as diagnoses and procedures. The information on age, diagnoses and procedures was used to select the cases to be analyzed. The goal was to include all patients over 18 years of age who had just suffered a heart attack due to coronary artery disease. Patients hospitalized prior to January 1, 1996 and after December 1, 1998 were not included in this study.

All non-federal acute-care hospitals in California were eligible to be included in this report. Some hospitals were not included for two possible reasons. First, some hospitals had no patients meeting the inclusion criteria. Second, some hospitals had eligible patients but were excluded because of unusual patterns in the discharge data they reported to the State. The most common reason for exclusion was an implausibly low percentage of patients with a common risk factor, such as high blood pressure.

### Risk Factors

Some hospitals have sicker patients than others. To make comparisons as fair as possible, we adjusted each hospital's mortality rate for severity of illness. A combination of clinical expertise and statistical tests was used to identify the risk factors that were used in the adjustment process. This process used all information reported by hospitals, including patient age, sex, the type and location of the heart attack, and chronic diseases such as those listed in the table on the next page.

Two different statistical models, or sets of risk factors, were used to adjust for patient differences. Some demographic factors, such as insurance status and race, and some clinical factors, such as coma and shock, *may* reflect a patient's health at admission. They *may also* be associated with the quality of care that the patient received or events that happened after admission. Factors reflecting quality of care should not be included in risk-adjustment models, because they are at least partially under the hospital's control.

The first model, called **Model A**, is more conservative because the demographic and clinical risk factors it contains almost certainly were present when the patient entered the hospital and reflect his or her health at admission. The second model, called **Model B**, is less conservative but more comprehensive because it contains all of the risk factors in Model A as well as others that may be associated with *either* health at admission *or* the quality of care received after being admitted.

Model A adjusts for differences in patient characteristics, but not differences in the quality of care. Model B adjusts for a longer list of patient characteristics, but may do so at the expense of mixing some patient characteristics with measures of quality of care. When such mixing occurs, hospitals might be unfairly adjusted (i.e. "credited") for risk. For example, patients without insurance may be sicker than insured patients when they enter the hospital (a valid risk factor). On the other hand, resource constraints associated with caring for uninsured patients may lead to worse care (not a valid risk factor). As another example, some patients may have pneumonia at the time of their admission (a valid risk factor), while others may develop pneumonia during their hospital stay (not a valid risk factor). Thus, while Model B's larger number of risk factors allows it to account for more of the variation in mortality across hospitals, it may do so at the expense of inaccurate risk-adjustment.

One cannot say whether one model is better than the other. In the final analysis, to the extent that both models give similar results, one can be more confident of their results.

#### **MOST IMPORTANT RISK FACTORS IN BOTH MODELS**

- Age
- Sex
- Type of heart attack
- Chronic diseases, such as
  - ◆ Liver disease
  - ◆ Kidney disease
  - ◆ Heart disease
  - ◆ Neurologic disease
  - ◆ Cancer
  - ◆ Diabetes

## Outcome Rates

The risk-adjustment models described above were used to estimate each patient's chance of dying, measured as an individual probability. The actual number of deaths at each hospital was then compared to the expected number of deaths derived by adding these probabilities. This resulted in the hospital ratings shown in Section 6, "Comparing Observed to Expected Mortality." Risk-adjusted mortality rates were also estimated for each hospital, so that the performance of each hospital could be evaluated alongside that of other hospitals in the same community. The results are shown in Section 7, "Comparing Hospital Rates to the Statewide Rate." Compared to previous reports, the statewide 30-day death rate has declined steadily from 15.1 % in 1991, to 13.0 % in 1994, and to 12.1 % in 1998.

### STATEWIDE FREQUENCIES

Year	Number of AMI patients hospitalized	Number of deaths within 30 days of admission	30-day death rate
1996	43,400	5,285	12.18%
1997	43,703	5,255	12.02%
1998	41,406	4,996	12.07%
<b>TOTAL</b>	<b>128,509</b>	<b>15,536</b>	<b>12.09%</b>

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## Interpreting the Results

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*Quality of care is one reason a hospital's heart attack mortality rate may be unusually high or unusually low. It is important to understand the other three factors that may contribute to an individual hospital's results.*

### Unmeasured Risk

As mentioned earlier, the data reported to the State do not identify all possible risk factors. For example, some hospitals treat a large percentage of patients who do not wish to be resuscitated if cardiac arrest should occur. Other hospitals may have few of these patients. Information on resuscitation status was not available in the data used for this analysis so it could not be used as a risk factor. Therefore, if a hospital has an unusually large percentage of Do Not Resuscitate (DNR) patients, its risk-adjusted death rate may be too high when compared with a hospital that has very few DNR patients.

### Variations in Reporting

Variations in reporting practices may affect a hospital's risk-adjusted outcomes. Hospitals that neglect to report important risk factors could have risk-adjusted mortality rates that are too high. However, the heart attack validation study published in 1996 showed that differences in hospital reporting practices explain little of the variation in risk-adjusted mortality. Nevertheless this may be a problem for a few hospitals.

### Chance

Chance is important to consider because no matter how careful the study, the results may have occurred randomly, particularly in hospitals with relatively few cases. For example, five coin tosses resulting in four heads and one tail (80 % heads) is quite possible. Five hundred coin tosses resulting in four hundred heads (80 % heads) is quite improbable. Statistical methods can compute how probable such an outcome would be. Researchers must decide where to draw the line between findings that should and should not be attributed to chance. A finding is called "statistically significant" when the probability of it being explained by chance is so low that the researcher is willing to risk incorrectly labeling the finding as true.

Statistical significance is measured in p-values. The p-value of 0.01 used in this report means that one time in 100 a hospital may be classified as an outlier due to chance alone.

## Quality of Care

Finally, hospitals designated as having better or worse than expected outcomes in the table beginning on page 16 may provide better or worse quality of care than those not so designated. The process of care was not evaluated in this study, so the specific practices that may account for the performance of these facilities are not known. However, the validation study (published in 1996) identified several potential differences between hospitals with low risk-adjusted mortality and those with high risk-adjusted mortality. These include differences in the use of invasive treatments, such as angioplasty and coronary artery bypass surgery, and certain medications, such as heparin and aspirin.

### RISK-ADJUSTED MORTALITY RATES, 1996-1998

Category	Number	Percent
As Expected	304	76.4
Better than expected in at least one model	32	8.0
Worse than expected in at least one model	42	10.6
No deaths; too few cases	20	5.0

Another way of assessing hospital performance is to compare risk-adjusted mortality rates over time. A comparison of the results in this report with the previous report indicates that among the 386 hospitals included in both reports, 89 changed categories in this report. Of the 32 hospitals in the better than expected category, 18 were in that category previously. Of the 42 hospitals in the worse than expected category, 15 remained in this category from the previous report.

### CHANGE IN CATEGORIES

Status in Previous Report (1994-1996)	Status in Current Report (1996-1998)				
		Better Than Expected	As Expected	Worse Than Expected	No Deaths
Better Than Expected		18	15	0	0
As Expected		14	256	26	8
Worse Than Expected		0	23	15	0
No Deaths		0	3	0	8

Ten of the eighteen hospitals that performed better than expected in the 1994-1996 and 1996-1998 reports also performed better than expected in the earlier 1991-1993 report. Their exceptional record in all three reports represents a consistently superior outcome over an eight year time span.

### BETTER THAN EXPECTED IN THE LAST THREE REPORTS

Kaiser Foundation Hospital - Walnut Creek	Contra Costa County
Cedars-Sinai Medical Center	Los Angeles County
Long Beach Memorial Medical Center	Los Angeles County
St John's Health Center	Los Angeles County
Temple Community Center	Los Angeles County
UCLA Medical Center	Los Angeles County
Tahoe Forest Hospital District	Nevada County
Kaiser Foundation Hospital - San Diego	San Diego County
California Pacific Medical Center - Pacific Campus	San Francisco County
Kaiser Foundation Hospital - Geary (San Francisco)	San Francisco County

Eight hospitals performed better than expected in the 1994-1996 and 1996-1998 reports, but not in the 1991-1993 report.

#### **BETTER THAN EXPECTED IN THE LAST TWO REPORTS**

Kaiser Foundation Hospital - Oakland (East Bay Medical Center)	Alameda County
Glendale Memorial Hospital and Health Center	Los Angeles County
Kaiser Foundation Hospital - Bellflower	Los Angeles County
Providence Saint Joseph Medical Center	Los Angeles County
Salinas Valley Memorial Hospital	Monterey County
Kaiser Foundation Hospital - Sacramento	Sacramento County
Needles-Dessert Communities Hospital	San Bernardino County
Sequoia Hospital	San Mateo County

Seven of the fifteen hospitals that performed worse than expected in the 1994-1996 and 1996-1998 reports also performed worse than expected in the earlier 1991-1993 report.

#### **WORSE THAN EXPECTED IN THE LAST THREE REPORTS**

San Leandro Hospital	Alameda County
Kern Medical Center	Kern County
Memorial Hospital of Gardena	Los Angeles County
Chino Valley Medical Center	San Bernardino County
San Antonio Community Hospital	San Bernardino County
Scripps Hospital - East County	San Diego County
Tulare District Healthcare System	Tulare County

The following eight hospitals performed worse than expected in the 1994-1996 and 1996-1998 reports, but not in the 1991-1993 report.

#### **WORSE THAN EXPECTED IN THE LAST TWO REPORTS**

Sutter Delta Medical Center	Contra Costa County
University Medical Center	Fresno County
West Anaheim Medical Center	Orange County
Sutter General Hospital	Sacramento County
Redlands Community Hospital	San Bernardino County
Community Hospital of San Bernardino	San Bernardino County
Sierra View District Hospital	Tulare County
St John's Regional Medical Center	Ventura County

## Mortality Results

*Hospital results have been summarized in two tables. The first table, beginning on page 19, shows which hospitals have mortality rates significantly better or worse than expected. The second table, beginning on page 49, compares each hospital's overall risk-adjusted mortality rate with the statewide rate. Hospitals are listed alphabetically by county in both tables. If you cannot find a particular hospital, it is possible that the hospital does not treat heart attack patients or that it is listed under another name.*

### Comparing Observed and Expected Mortality

#### OVERALL RESULTS

- ✱ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- ☐ Not significantly different than expected
- Significantly worse than expected ( $p < 0.01$ )

These symbols represent the four categories of overall results for 1996 through 1998. Hospitals having mortality rates significantly lower (better) than expected ( $p < .01$ ), based on the characteristics of their patients, are represented by a bold star (✱). Hospitals having mortality rates significantly higher (worse) than expected ( $p < .01$ ) are represented by a solid circle (●). All other hospitals are in the middle category.

A special symbol (☑) represents hospitals that had no deaths during these three years, but treated too few heart attack cases to be statistically classified as significantly better than expected.

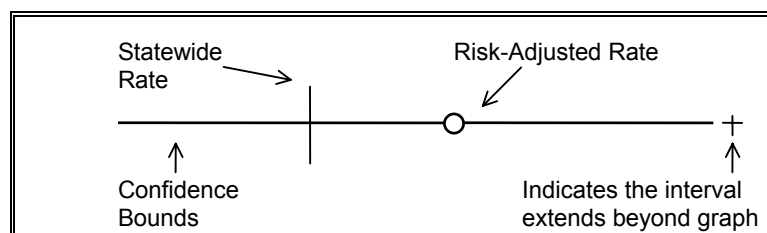
Two hospitals were excluded for all three years of the study because of limitations in the data they reported to OSHPD. Section 5 in the *Technical Guide* gives more detail about the hospitals that were excluded.

Hospitals that submitted comment letters are designated by the symbol ‡. Those letters are published in an accompanying volume, *Hospital Comment Letters*. It is important to read these letters so that hospital results can be more completely understood.

## Comparing Risk-Adjusted Rates with the Statewide Death Rate

Another way of evaluating a hospital is to compare its risk-adjusted death rate to the statewide rate. The second table, which is a graphical representation of each hospital's aggregate risk-adjusted death rate, presents this comparison. The vertical line represents the statewide average. The circle on the horizontal bar is the hospital's risk-adjusted mortality rate.

The two separate one-tailed, 1% significance tests used to produce the bold star (★) and solid circle (●) at the lower- and higher-than-expected levels combine to produce a 98% confidence interval around the risk-adjusted rate (indicated below by the open circle). The bar represents the 98% confidence bounds surrounding that mortality rate. This means that there is a 98% probability the hospital's true risk-adjusted mortality rate falls somewhere on that bar. Therefore, if the bar crosses the state average, the hospital's overall results are not significantly different from the state average. In general, the more cases a hospital treats, the smaller the confidence bounds surrounding its risk-adjusted rate.



## Comparing Observed to Expected Mortality

## Report on Heart Attack Outcomes, 1996-1998

## Model A

## Model B

## Alameda County

Alameda County Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Alameda Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Alta Bates Medical Center - Ashby Campus	<input type="checkbox"/>	<input type="checkbox"/>
Alta Bates Summit Medical Center - Summit Campus	<input type="checkbox"/>	<input type="checkbox"/>
Eden Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - Hayward	★	★
Kaiser Foundation Hospital - Oakland (East Bay Medical Center)	★	★
San Leandro Hospital‡	●	<input type="checkbox"/>
St. Rose Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Valley Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Washington Hospital Health Care System	<input type="checkbox"/>	<input type="checkbox"/>

## Amador County

Sutter Amador Hospital	<input type="checkbox"/>	<input type="checkbox"/>
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- ★ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

## Butte County

Biggs Gridley Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Enloe Medical Center - Esplanade	<input type="checkbox"/>	<input type="checkbox"/>
Feather River Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Oroville Hospital	<input type="checkbox"/>	<input type="checkbox"/>

## Calaveras County

Mark Twain St. Joseph's Hospital	<input type="checkbox"/>	<input type="checkbox"/>
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## Colusa County

Colusa Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
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## Contra Costa County

Contra Costa Regional Medical Center	●	<input type="checkbox"/>
Doctors Medical Center, Pinole Campus	<input type="checkbox"/>	<input type="checkbox"/>
Doctors Medical Center, San Pablo Campus	<input type="checkbox"/>	<input type="checkbox"/>
John Muir Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - Richmond	☑	☑
Kaiser Foundation Hospital - Walnut Creek	★	★
Mt. Diablo Medical Center‡	●	●
San Ramon Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Sutter Delta Medical Center	●	●

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 □ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system



## Del Norte County

Sutter Coast Hospital



## El Dorado County

Barton Memorial Hospital



Marshall Hospital



## Fresno County

Coalinga Regional Medical Center



Community Medical Center of Clovis‡



Fresno Community Hospital and Medical Center



Kaiser Foundation Hospital - Fresno



Kingsburg District Hospital



Sanger General Hospital



Selma District Hospital



Sierra Kings District Hospital



St. Agnes Medical Center‡



University Medical Center - Fresno‡



## Glenn County

Glenn Medical Center



- ☒ Significantly better than expected ( $p < 0.01$ )  
☒ No deaths reported; too few cases for statistical significance  
☐ Not significantly different than expected

- ☒ Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## Humboldt County

General Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Gerold Phelps Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Mad River Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Redwood Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
St. Joseph Hospital - Eureka	<input type="checkbox"/>	<input type="checkbox"/>

## Imperial County

El Centro Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Pioneers Memorial Healthcare District	<input type="checkbox"/>	<input type="checkbox"/>

## Inyo County

Northern Inyo Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Southern Inyo Hospital	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- ⊕ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

## Kern County

Bakersfield Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Delano Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Good Samaritan Hospital - Bakersfield	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Kern Medical Center	●	<input type="checkbox"/>
Kern Valley Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Mercy Hospital - Bakersfield	●	●
Mercy Westside Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Ridgecrest Regional Hospital	<input type="checkbox"/>	<input type="checkbox"/>
San Joaquin Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

## Kings County

Corcoran District Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Hanford Community Medical Center	<input type="checkbox"/>	<input type="checkbox"/>

## Lake County

Adventist Health - Redbud Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Sutter Lakeside Hospital	<input type="checkbox"/>	<input type="checkbox"/>

## Lassen County

Lassen Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
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- ☼ Significantly better than expected ( $p < 0.01$ )  
☒ No deaths reported; too few cases for statistical significance  
☐ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## Los Angeles County

Alhambra Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Antelope Valley Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Bay Harbor Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Bellflower Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Beverly Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Brotman Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
California Hospital Medical Center - Los Angeles	<input type="checkbox"/>	<input type="checkbox"/>
Cedars-Sinai Medical Center	★	★
Centinela Hospital Medical Center	<input type="checkbox"/>	●
Century City Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Citrus Valley Med Center - Queen of the Valley Campus	<input type="checkbox"/>	<input type="checkbox"/>
City of Hope National Medical Center	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 ☐ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## Los Angeles County, Continued

Coast Plaza Doctors Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Community & Mission Hospitals - Huntington Park	<input type="checkbox"/>	<input type="checkbox"/>
Community and Mission Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Community Hospital of Gardena	<input type="checkbox"/>	<input type="checkbox"/>
Daniel Freeman Marina Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Daniel Freeman Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Desert Palms Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Doctors Hospital of West Covina	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Downey Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
East Los Angeles Doctor's Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Encino Tarzana Regional Med Center - Encino	<input type="checkbox"/>	<input type="checkbox"/>
Encino Tarzana Regional Med Center - Tarzana	★	★
Foothill Presbyterian Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Garfield Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Glendale Adventist Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Glendale Memorial Hospital and Health Center	<input type="checkbox"/>	★
Granada Hills Community Hospital‡	●	<input type="checkbox"/>

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 □ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## Los Angeles County, Continued

Greater El Monte Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Henry Mayo Newhall Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Hollywood Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Huntington East Valley Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Huntington Memorial Hospital‡	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - Baldwin Park	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - Bellflower	★	<input type="checkbox"/>
Kaiser Foundation Hospital - Harbor City	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - Los Angeles	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - Panorama City	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - West Los Angeles	★	<input type="checkbox"/>
Kaiser Foundation Hospital - Woodland Hills	<input type="checkbox"/>	<input type="checkbox"/>
L.A. Co/Olive View-UCLA Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
L.A. Co/Rancho Los Amigos National Rehab Ctr	<input type="checkbox"/>	<input type="checkbox"/>
L.A. Co/USC Medical Center	●	<input type="checkbox"/>
LAC/Harbor - UCLA Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
LAC/High Desert Hospital	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 □ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## Los Angeles County, Continued

Lakewood Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Lancaster Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Lincoln Hospital Medical Center	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Little Company of Mary Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Long Beach Community Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Long Beach Doctor's Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Long Beach Memorial Medical Center	★	<input type="checkbox"/>
Los Angeles Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Los Angeles Community Hospital of Norwalk	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Los Angeles Metropolitan Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Memorial Hospital of Gardena	●	●
Methodist Hospital of Southern California	<input type="checkbox"/>	<input type="checkbox"/>
Midway Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Mission Community Hospital‡	<input type="checkbox"/>	<input type="checkbox"/>
Monrovia Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Monterey Park Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Motion Picture & Television Hospital	<input type="checkbox"/>	<input type="checkbox"/>

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 ☐ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## Los Angeles County, Continued

North Hollywood Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Northridge Hosp Med Center - Sherman Way Campus	<input type="checkbox"/>	<input type="checkbox"/>
Northridge Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Orthopaedic Hospital	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pacific Alliance Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Pacific Hospital of Long Beach	<input type="checkbox"/>	<input type="checkbox"/>
Pacifica Hospital of the Valley	●	<input type="checkbox"/>
Pioneer Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Pomona Valley Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Presbyterian Inter-Community Hospital‡	●	<input type="checkbox"/>
Providence Holy Cross Medical Center‡	<input type="checkbox"/>	<input type="checkbox"/>
Providence Saint Joseph Medical Center	★	★
Queen of Angels - Hollywood Presbyterian Med Center	<input type="checkbox"/>	<input type="checkbox"/>
Robert F. Kennedy Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
San Dimas Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 □ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system



## Los Angeles County, Continued

San Gabriel Valley Medical Center	●	□
San Pedro Peninsula Hospital	□	□
Santa Marta Hospital	□	□
Santa Monica - UCLA Medical Center	□	□
Santa Teresita Hospital	●	●
SHC Speciality Hospital	☑	☑
Sherman Oaks Hospital & Health Center	□	□
South Bay Hospital	□	□
Specialty Hospital of Southern California‡	●	●
St John's Health Center	★	★
St Mary Medical Center	□	★
St. Francis Medical Center	□	□
St. Luke Medical Center	□	□
St. Vincent Medical Center‡	□	★
Suburban Medical Center	□	□
Temple Community Hospital	★	□
The Good Samaritan Hospital	□	□

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 □ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## Los Angeles County, Continued

Thompson Memorial Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Torrance Memorial Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Tri City Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
UCLA Medical Center	<input type="checkbox"/>	★
USC Kenneth Norris Jr. Cancer Hospital	<input type="checkbox"/>	<input type="checkbox"/>
USC University Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Valley Presbyterian Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Verdugo Hills Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Washington Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
West Hills Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Westside Hospital	<input type="checkbox"/>	<input type="checkbox"/>
White Memorial Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Whittier Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Woodruff Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

## Madera County

Chowchilla District Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Madera Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

- ☒ Significantly better than expected ( $p < 0.01$ )  
☒ No deaths reported; too few cases for statistical significance  
☐ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## Marin County

Kaiser Foundation Hospital - San Rafael	<input type="checkbox"/>	<input type="checkbox"/>
Marin General Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Novato Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

## Mariposa County

John C. Fremont Healthcare District	<input type="checkbox"/>	<input type="checkbox"/>
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## Mendocino County

Frank R. Howard Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Mendocino Coast Healthcare District	<input type="checkbox"/>	<input type="checkbox"/>
Ukiah Valley Medical Center	<input type="checkbox"/>	<input type="checkbox"/>

## Merced County

Bloss Memorial Healthcare District	<input type="checkbox"/>	<input type="checkbox"/>
Memorial Hospital - Los Banos	<input type="checkbox"/>	●
Mercy Hospital & Health Services - Merced	<input type="checkbox"/>	<input type="checkbox"/>
Sutter Merced Medical Center	<input type="checkbox"/>	<input type="checkbox"/>

## Modoc County

Modoc Medical Center	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Surprise Valley Healthcare District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- ⊕ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

Mono County

Mammoth Hospital



Monterey County

Community Hospital of the Monterey Peninsula



George L. Mee Memorial Hospital



Natividad Medical Center



Salinas Valley Memorial Hospital



Napa County

Nelson Holderman Memorial Center



Queen of the Valley Hospital, Napa Valley Med Center



St. Helena Hospital



Nevada County

Sierra Nevada Memorial Hospital



Tahoe Forest Hospital District



- ⬢ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- ☐ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

Orange County

Anaheim General Hospital	●	●
Anaheim Memorial Medical Center	□	□
Brea Community Hospital	●	●
Chapman Medical Center	□	□
Coastal Communities Hospital	□	□
College Hospital Costa Mesa	□	□
Fountain Valley Regional Hosp & Med Center - Euclid	□	□
Friendly Hills Regional Medical Center	□	□
Garden Grove Hospital and Medical Center	□	□
Hoag Memorial Hospital Presbyterian	□	□
Huntington Beach Hospital	□	□
Irvine Regional Hospital and Medical Center	□	□
Kaiser Foundation Hospital - Anaheim	□	□
La Palma Inter-Community Hospital	□	□
Los Alamitos Medical Center	□	□
Orange County Community Hospital - Buena Park	□	□

- ⊕ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

## Orange County, Continued

Martin Luther Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Mission Hospital Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Orange Coast Memorial Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Pacifica Hospital	●	●
Placentia-Linda Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Saddleback Memorial Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
San Clemente Hospital & Medical Center‡	<input type="checkbox"/>	<input type="checkbox"/>
Santa Ana Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
South Coast Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
St. Joseph Hospital - Orange	<input type="checkbox"/>	<input type="checkbox"/>
St. Jude Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Tustin Hospital and Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
UC Irvine Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
West Anaheim Medical Center	●	●
Western Medical Center - Anaheim	<input type="checkbox"/>	<input type="checkbox"/>
Western Medical Center - Santa Ana‡	<input type="checkbox"/>	<input type="checkbox"/>

- ☼ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 ☐ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

Placer County

Sutter Auburn Faith Hospital

☐
☐

Sutter Roseville Medical Center

☐
☐

Plumas County

Eastern Plumas Healthcare District

☐
☐

Indian Valley Healthcare District

☐
☐

Plumas District Hospital

☒
☒

Seneca Healthcare District

☐
☐

- ⊕ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- ☐ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

## Riverside County

Corona Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Desert Regional Medical Center‡	<input type="checkbox"/>	<input type="checkbox"/>
Eisenhower Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Hemet Valley Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Inland Valley Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
John F. Kennedy Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - Riverside	<input type="checkbox"/>	<input type="checkbox"/>
Menifee Valley Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Moreno Valley Community Hospital	●	●
Palo Verde Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Parkview Community Hospital‡	<input type="checkbox"/>	●
Rancho Springs Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Riverside Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Riverside County Regional Medical Center	<input type="checkbox"/>	●
San Geronio Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
The Heart Hospital	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Valley Plaza Doctors Hospital	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- ☉ Significantly better than expected ( $p < 0.01$ )  
☒ No deaths reported; too few cases for statistical significance  
☐ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system



## Sacramento County

Kaiser Foundation Hospital - Sacramento	★	★
Kaiser Foundation Hospital - South Sacramento	★	□
Mercy American River Hospital	●	□
Mercy General Hospital	□	□
Mercy Hospital of Folsom	□	□
Mercy San Juan Medical Center‡	★	★
Methodist Hospital of Sacramento	□	□
Sutter General Hospital‡	●	●
Sutter Memorial Hospital‡	□	□
UC Davis Medical Center	□	□

## San Benito County

Hazel Hawkins Memorial Hospital	□	□
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- ★ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

San Bernardino County

Arrowhead Regional Medical Center	●	●
Barstow Community Hospital	□	□
Bear Valley Community Hospital	□	□
Chino Valley Medical Center	●	□
Community Hospital of San Bernadino	●	□
Desert Valley Hospital	●	●
Hi-Desert Medical Center	□	□
Kaiser Foundation Hospital - Fontana	★	□
KPC Global Medical Center	□	□
Loma Linda University Medical Center	□	□
Mountains Community Hospital	☑	☑
Needles-Desert Communities Hospital	★	★
Redlands Community Hospital‡	□	●
San Antonio Community Hospital	●	●
St. Bernardine Medical Center	●	●
St. Mary Medical Center	□	□
Victor Valley Community Hospital	□	□

- ★ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

## San Diego County

Alvarado Hospital Medical Center	●	□
Fallbrook Hospital	□	□
Grossmont Hospital	□	□
Harbor View Medical Center	□	□
Kaiser Foundation Hospital - San Diego	★	★
Mission Bay Memorial Hospital	□	□
Palomar Medical Center	□	□
Paradise Valley Hospital	□	□
Pomerado Hospital	□	□
Scripps Green Hospital	□	□
Scripps Hospital - East County	●	●
Scripps Memorial Hospital - Chula Vista	□	□
Scripps Memorial Hospital - Encinitas	□	□
Scripps Memorial Hospital - La Jolla	□	□
Scripps Mercy Hospital	□	□
Sharp Cabrillo Hospital	□	□
Sharp Chula Vista Medical Center	□	□

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 □ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

## San Diego County, Continued

Sharp Coronado Hospital & Healthcare Center	<input type="checkbox"/>	<input type="checkbox"/>
Sharp Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Tri-City Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
UCSD Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
UCSD Medical Center - Thornton Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Villa View Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

## San Francisco County

California Pacific Medical Center - Pacific Campus‡	★	★
Chinese Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - San Francisco‡	★	★
Medical Center at UCSF	<input type="checkbox"/>	<input type="checkbox"/>
San Francisco General Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
St Francis Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
St. Luke's Hospital	<input type="checkbox"/>	<input type="checkbox"/>
St. Mary's Medical Center - San Francisco	<input type="checkbox"/>	<input type="checkbox"/>
UCSF - Mt. Zion	<input type="checkbox"/>	<input type="checkbox"/>

- ★ Significantly better than expected ( $p < 0.01$ )  
 ☑ No deaths reported; too few cases for statistical significance  
 □ Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system

San Joaquin County

Dameron Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Doctors Hospital of Manteca	<input type="checkbox"/>	<input type="checkbox"/>
Lodi Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
San Joaquin General Hospital‡	<input type="checkbox"/>	<input type="checkbox"/>
St. Dominic's Hospital	<input type="checkbox"/>	<input type="checkbox"/>
St. Joseph's Medical Center of Stockton	<input type="checkbox"/>	<input type="checkbox"/>
Sutter Tracy Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

San Luis Obispo County

Arroyo Grande Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
French Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
San Luis Obispo General Hospital	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sierra Vista Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Twin Cities Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

- ⊕ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

San Mateo County

Kaiser Foundation Hospital - Redwood City	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - South San Francisco	<input type="checkbox"/>	<input type="checkbox"/>
Mills-Peninsula Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
San Mateo General Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Sequoia Hospital	<input type="checkbox"/>	★
Seton Medical Center	<input type="checkbox"/>	<input type="checkbox"/>

Santa Barbara County

Goleta Valley Cottage Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Lompoc Healthcare District‡	<input type="checkbox"/>	<input type="checkbox"/>
Marian Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Santa Barbara Cottage Hospital	★	<input type="checkbox"/>
Santa Ynez Valley Cottage Hospital	<input type="checkbox"/>	<input type="checkbox"/>
St. Francis Medical Center of Santa Barbara	<input type="checkbox"/>	<input type="checkbox"/>
Valley Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>

- ★ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

Santa Clara County

Community Hospital of Los Gatos	★	□
El Camino Hospital	★	□
Good Samaritan Hospital - San Jose	□	□
Kaiser Foundation Hospital - Santa Clara	★	★
Kaiser Foundation Hospital - Santa Teresa Community Hospital	□	□
O'Connor Hospital	□	□
Regional Medical Center of San Jose	□	□
San Jose Medical Center	□	□
Santa Clara Valley Medical Center‡	●	●
St. Louise Hospital	□	□
St. Louise Regional Hospital	□	□
Stanford University Hospital	□	□

Santa Cruz County

Dominican Hospital	□	□
Watsonville Community Hospital	□	□

- ★ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

## Shasta County

Mayers Memorial Hospital



Mercy Medical Center - Redding



Redding Medical Center



## Siskiyou County

Fairchild Medical Center



Mercy Medical Center - Mt. Shasta



## Solano County

Kaiser Foundation Hospital - Vallejo



Northbay Medical Center‡



Sutter Solano Medical Center



Vaca Valley Hospital



- ☒ Significantly better than expected ( $p < 0.01$ )  
☒ No deaths reported; too few cases for statistical significance  
☐ Not significantly different than expected

- ☒ Significantly worse than expected ( $p < 0.01$ )  
 ‡ Comment letter received from hospital or hospital system



## Sonoma County

Healdsburg General Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Kaiser Foundation Hospital - Santa Rosa	<input type="checkbox"/>	<input type="checkbox"/>
North Coast Healthcare Ctr - Sotoyona Center	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Palm Drive Hospital‡	<input type="checkbox"/>	<input type="checkbox"/>
Petaluma Valley Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Santa Rosa Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Sonoma Valley Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Sutter Medical Center of Santa Rosa	<input type="checkbox"/>	<input type="checkbox"/>
Warrack Medical Center Hospital	<input type="checkbox"/>	<input type="checkbox"/>

## Stanislaus County

Del Puerto Hospital	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Doctors Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Emanuel Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Memorial Hospital Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Oak Valley Hospital District	<input type="checkbox"/>	<input type="checkbox"/>
Stanislaus Medical Center	<input type="checkbox"/>	<input type="checkbox"/>

## Sutter County

Fremont Medical Center‡	<input type="checkbox"/>	<input type="checkbox"/>
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- ⊕ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

Tehama County

St. Elizabeth Community Hospital



Trinity County

Trinity Hospital



Tulare County

Alta Hospital District



Kaweah Delta Healthcare District‡



Lindsay District Hospital



Memorial Hospital at Exeter



Sierra View District Hospital‡



Tulare District Healthcare System‡



Tuolumne County

Sonora Community Hospital



Tuolumne General Hospital



- ⊕ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

## Ventura County

Community Memorial Hospital - San Buenaventura	<input type="checkbox"/>	<input type="checkbox"/>
Los Robles Regional Medical Center	<input type="checkbox"/>	<input type="checkbox"/>
Ojai Valley Community Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Santa Paula Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Simi Valley Hospital & Health Care Services - Sycamore	<input type="checkbox"/>	<input type="checkbox"/>
St. John's Pleasant Valley Hospital	<input type="checkbox"/>	<input type="checkbox"/>
St. John's Regional Medical Center	●	<input type="checkbox"/>
Ventura County Medical Center	<input type="checkbox"/>	<input type="checkbox"/>

## Yolo County

Sutter Davis Hospital	<input type="checkbox"/>	<input type="checkbox"/>
Woodland Memorial Hospital	<input type="checkbox"/>	<input type="checkbox"/>

## Yuba County

Rideout Memorial Hospital‡	<input type="checkbox"/>	<input type="checkbox"/>
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- ⊕ Significantly better than expected ( $p < 0.01$ )
- ☑ No deaths reported; too few cases for statistical significance
- Not significantly different than expected

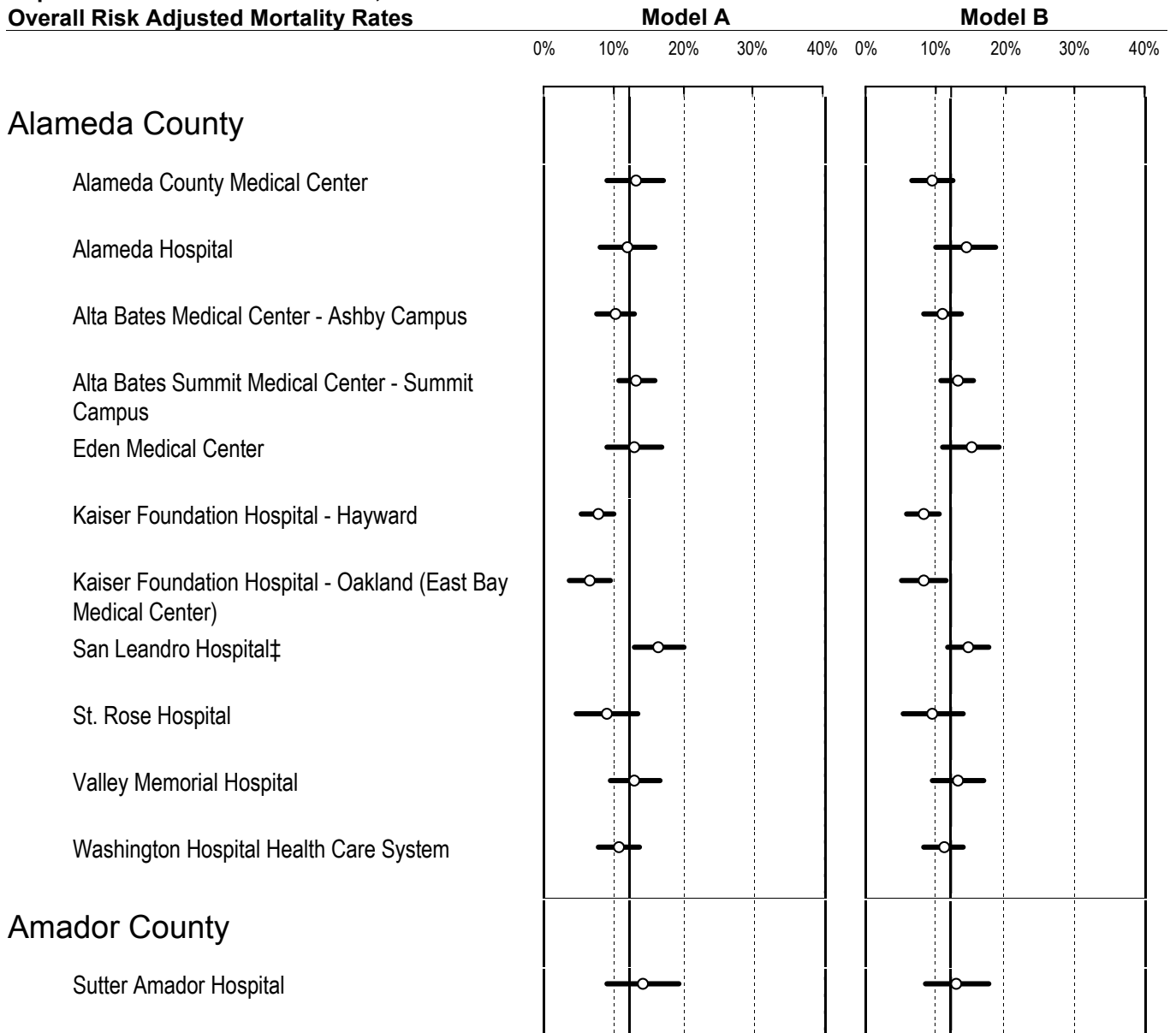
- Significantly worse than expected ( $p < 0.01$ )
- ‡ Comment letter received from hospital or hospital system

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# Section 7

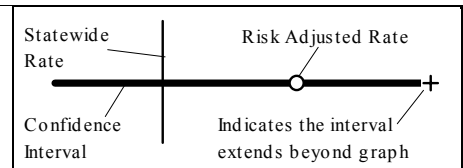
## Comparing Hospital Rates to the Statewide Rate

### Report on Heart Attack Outcomes, 1996-1998 Overall Risk Adjusted Mortality Rates

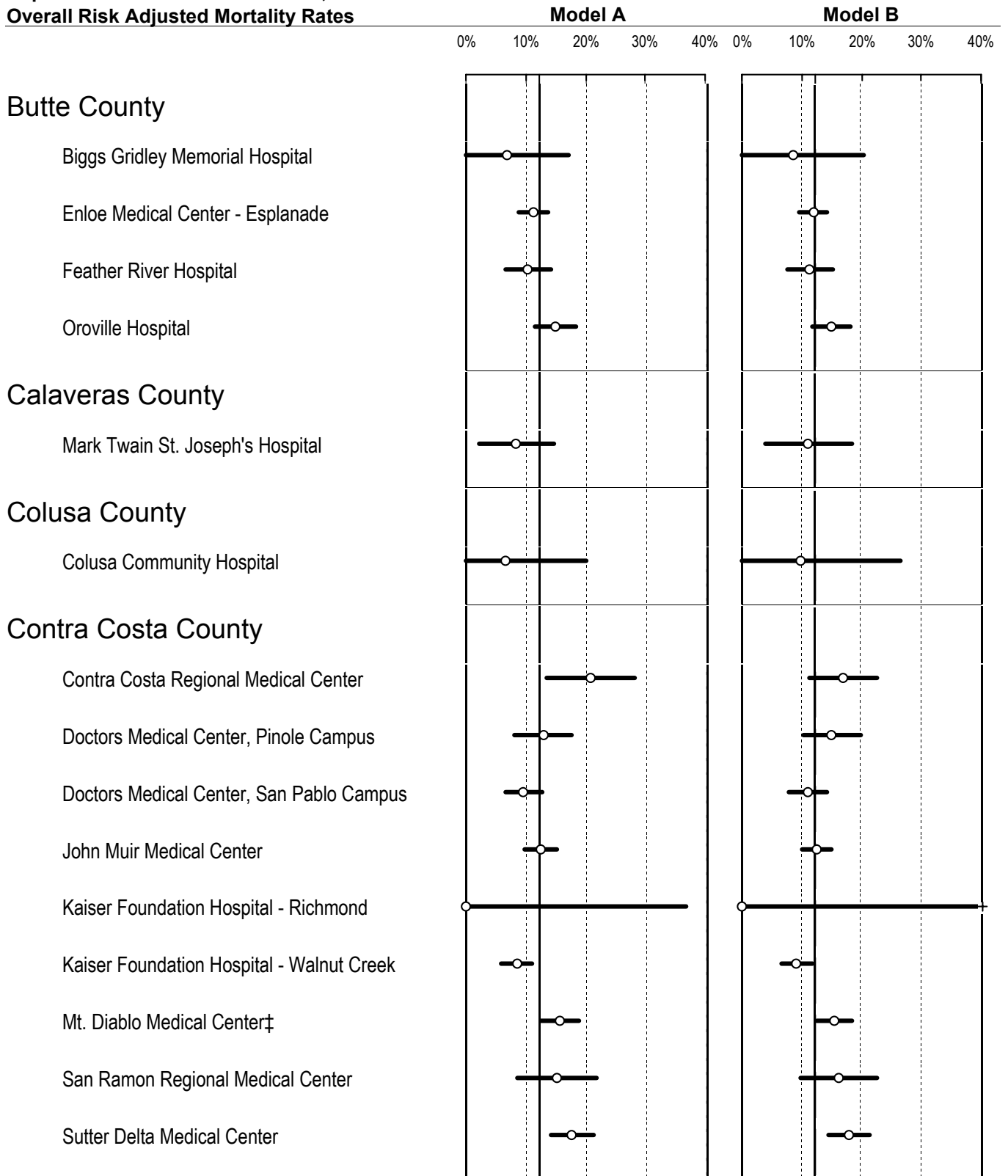


‡ Hospital sent comment letter.

† The estimated confidence limits for one of this hospital's risk-adjusted mortality rates have been adjusted to be consistent with the exact p-value shown in the Detailed Statistical Results.

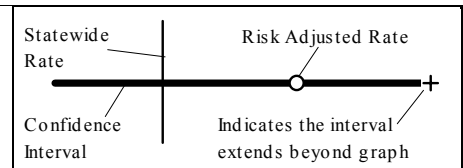


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

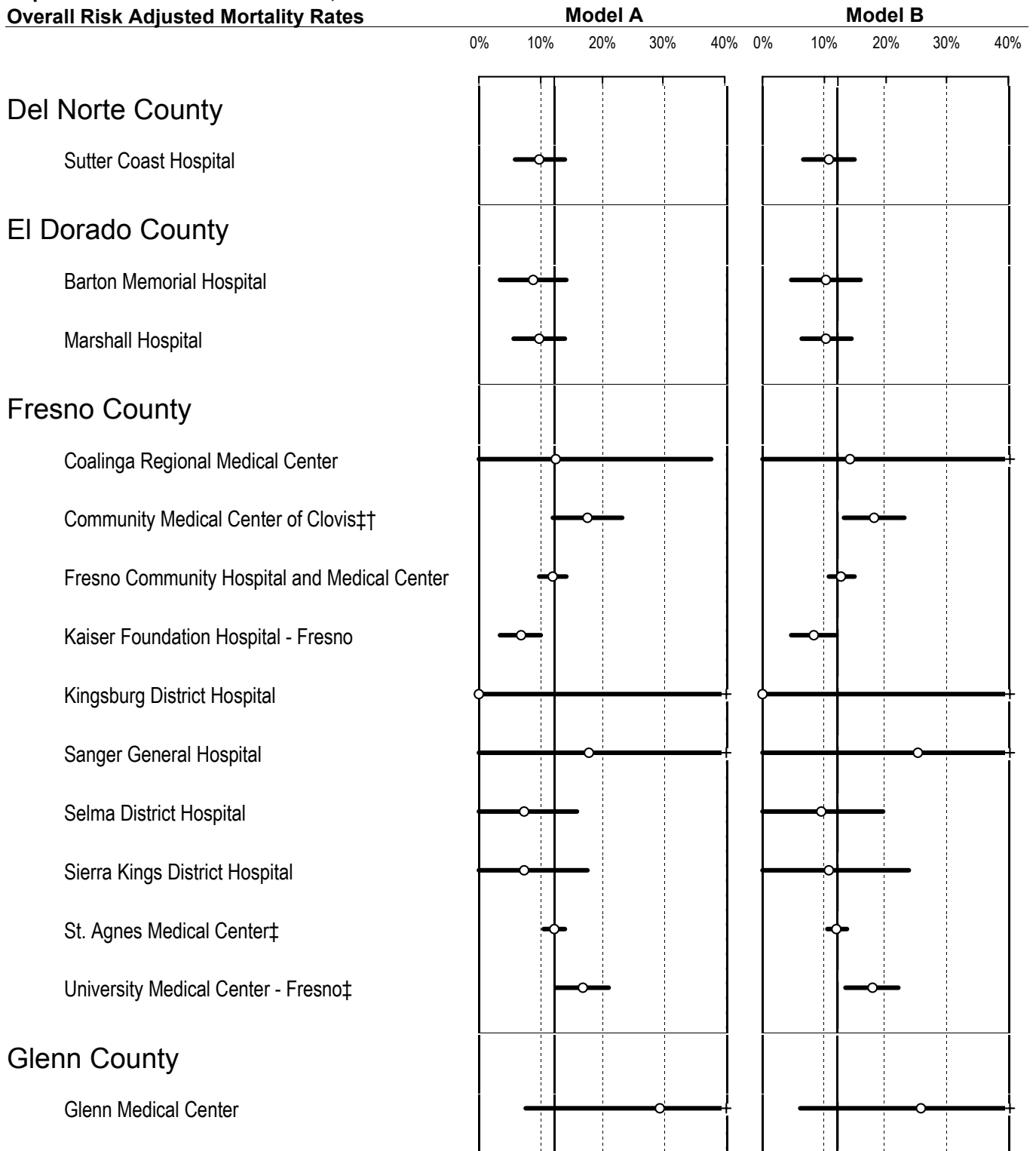


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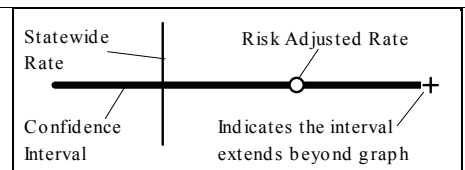


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

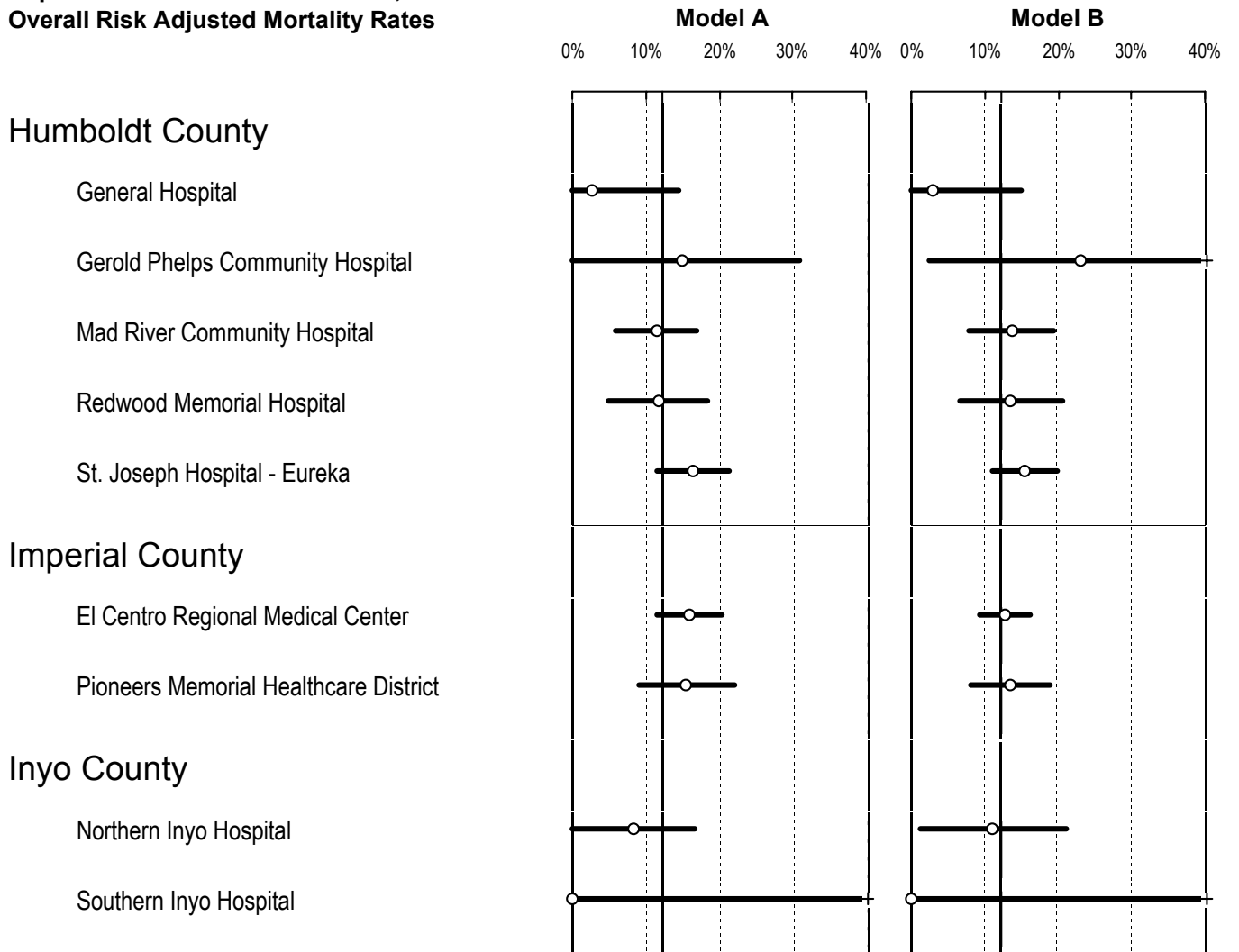


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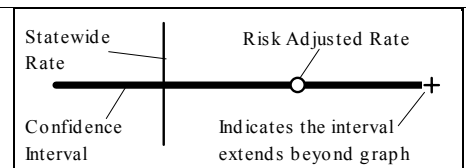


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**



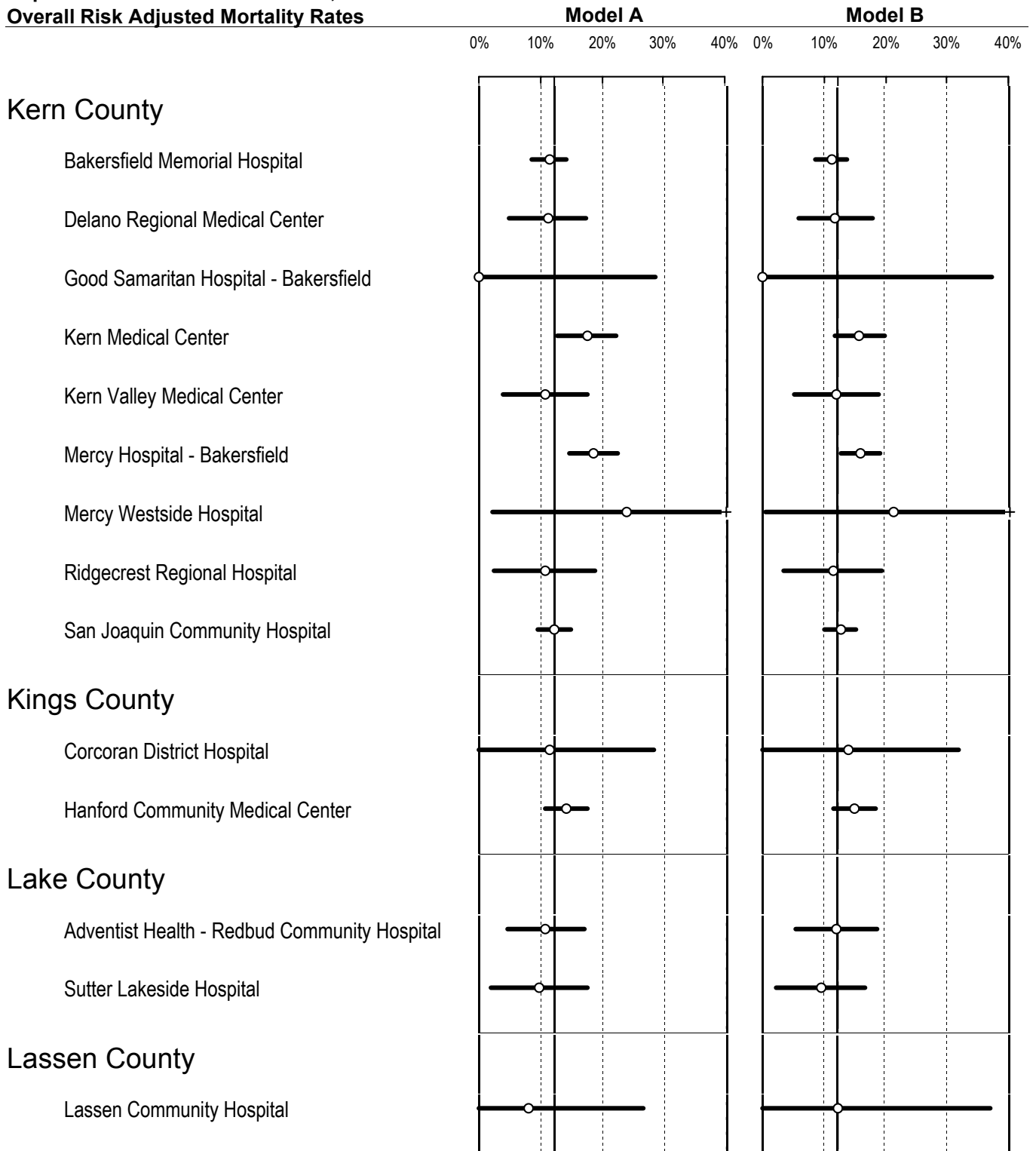
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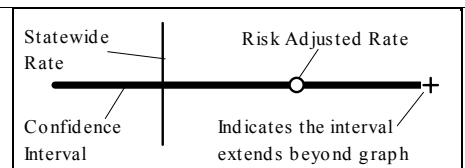


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

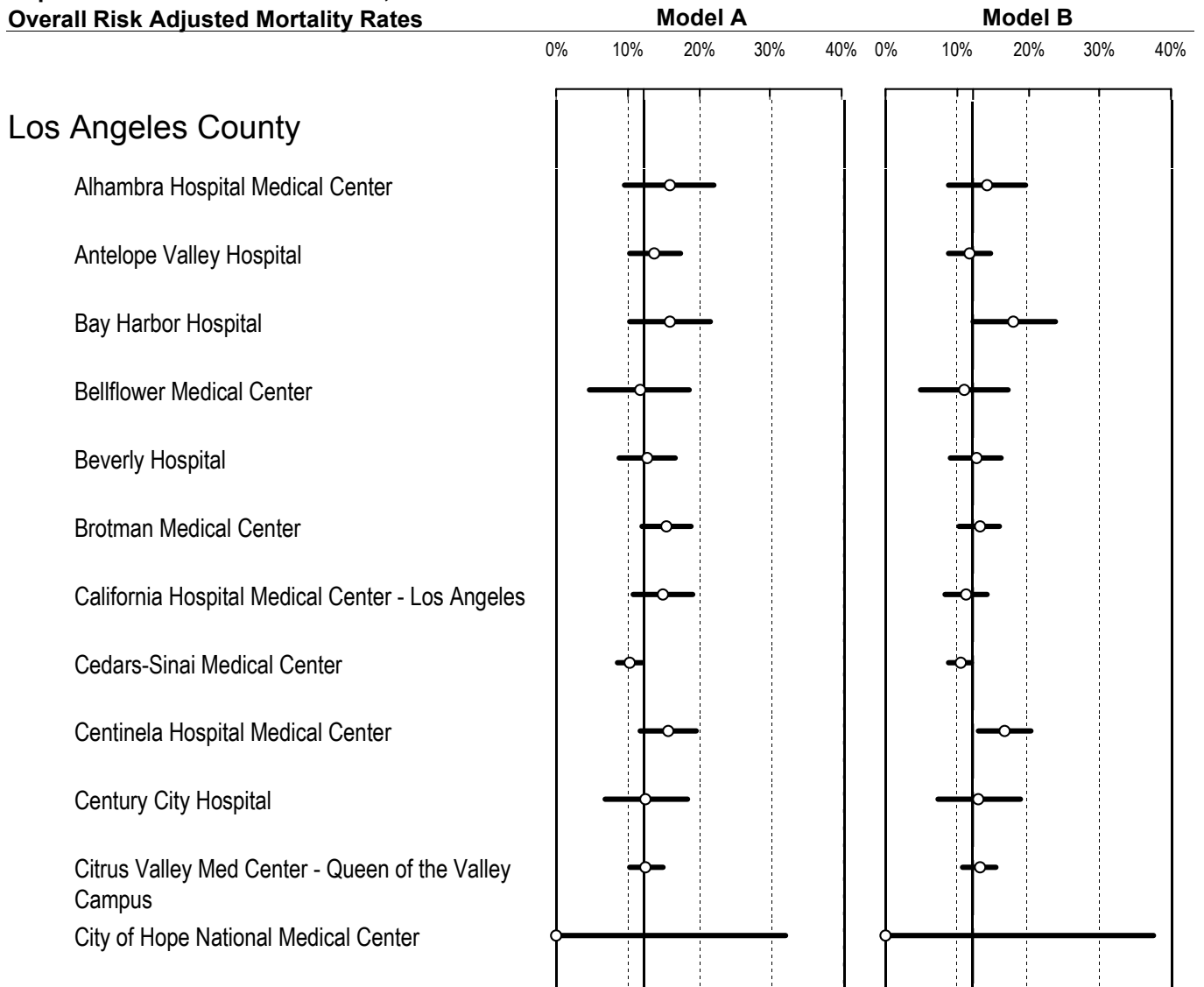


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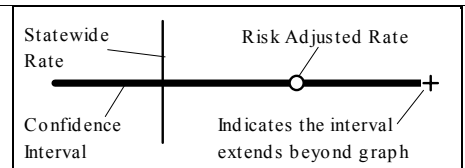


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

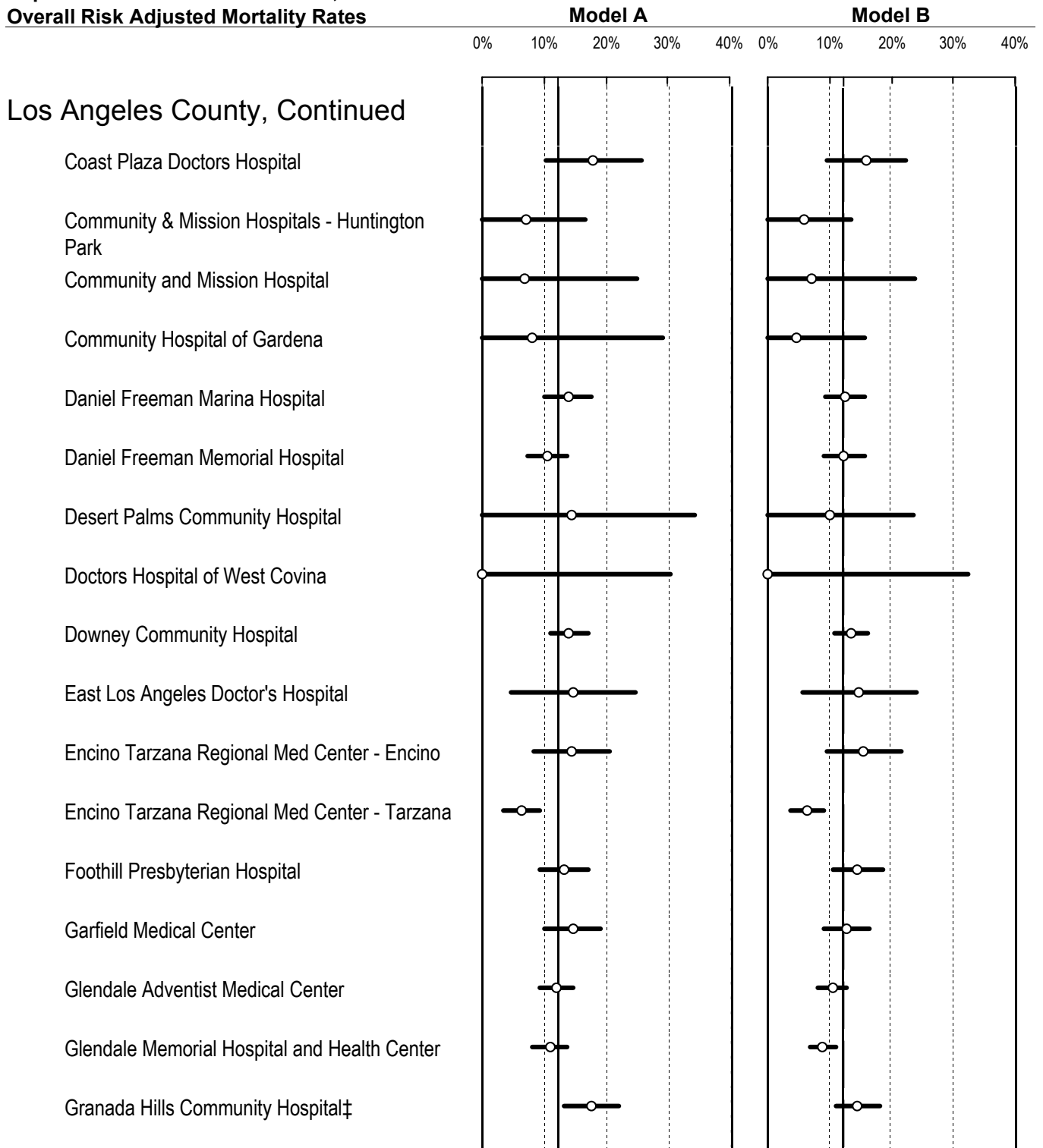


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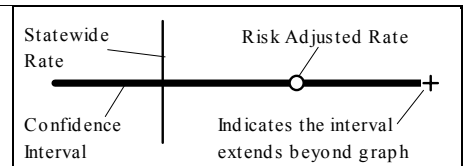


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

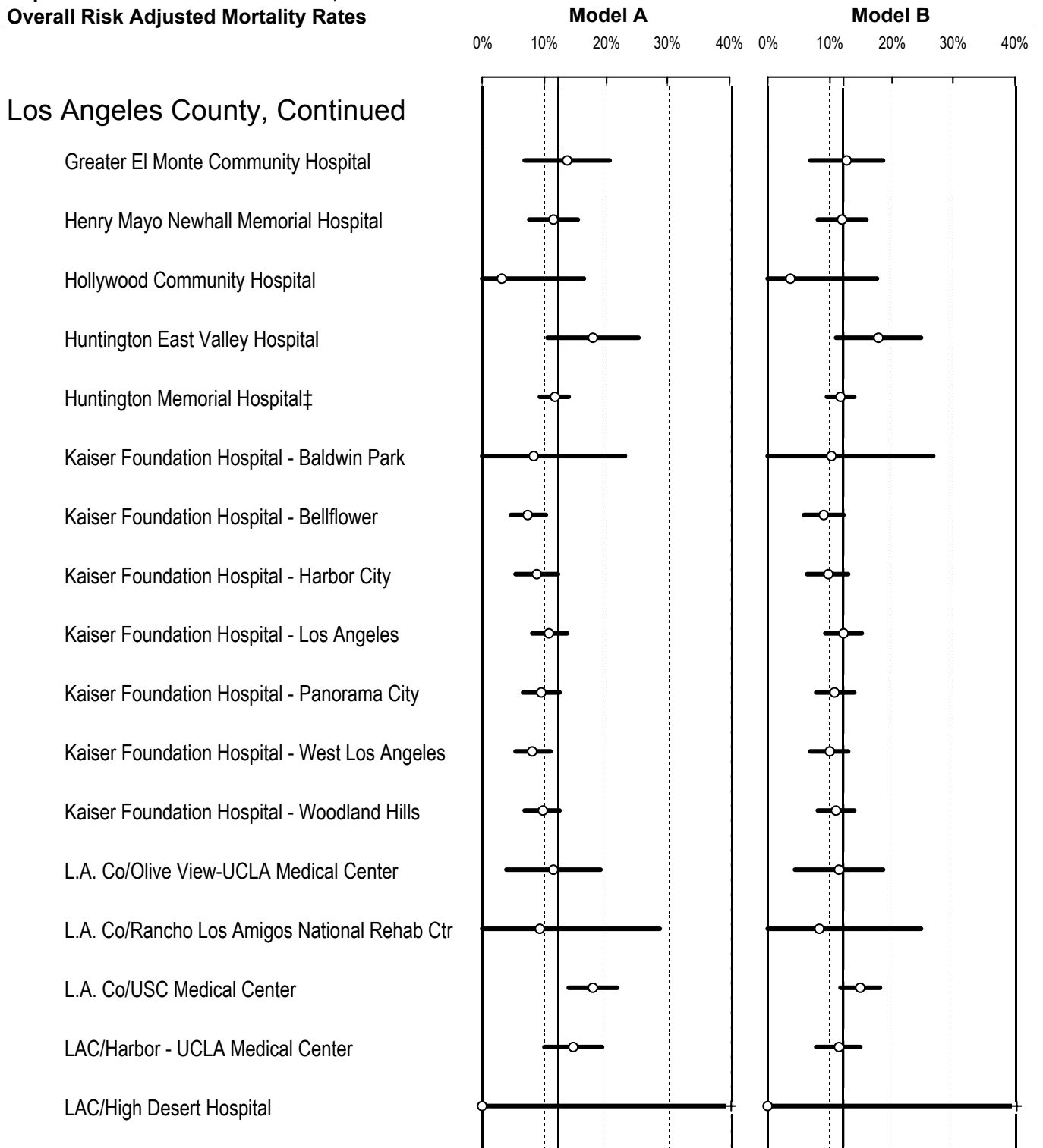


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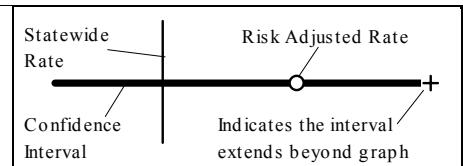


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

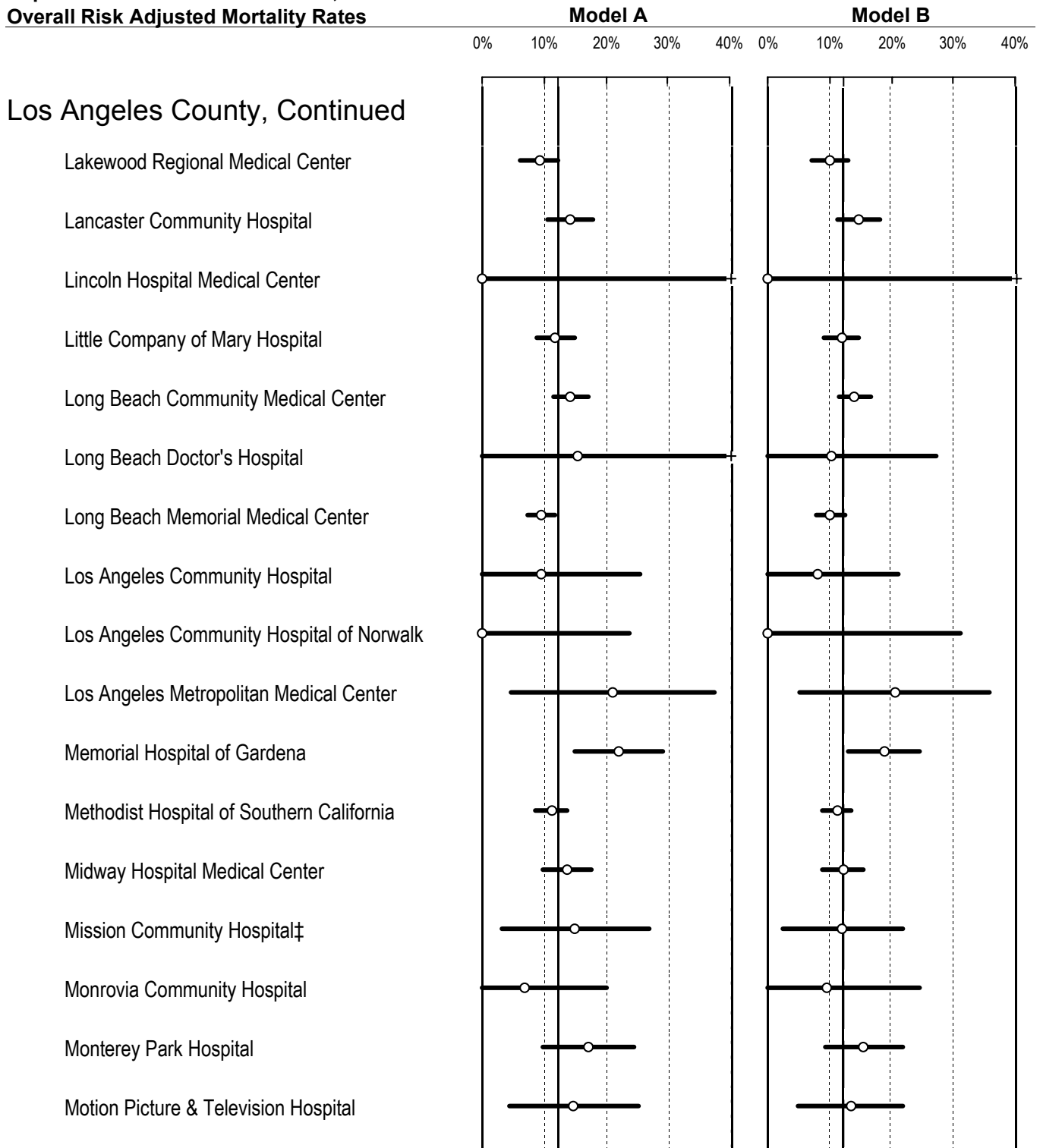


‡ Hospital sent comment letter.

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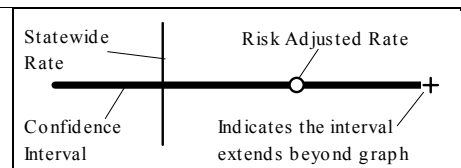


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

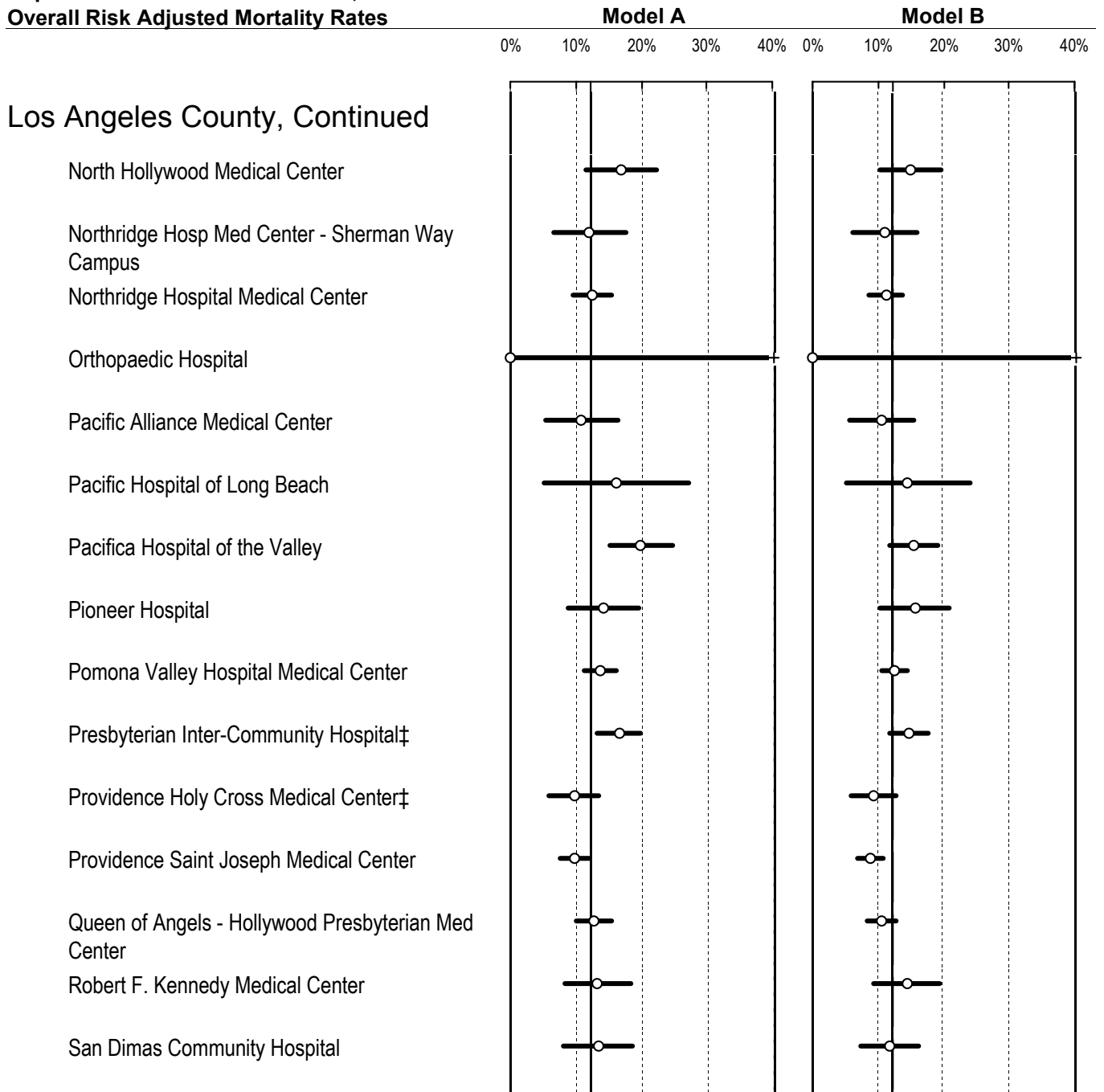


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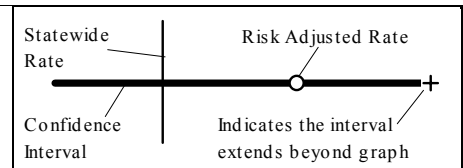


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

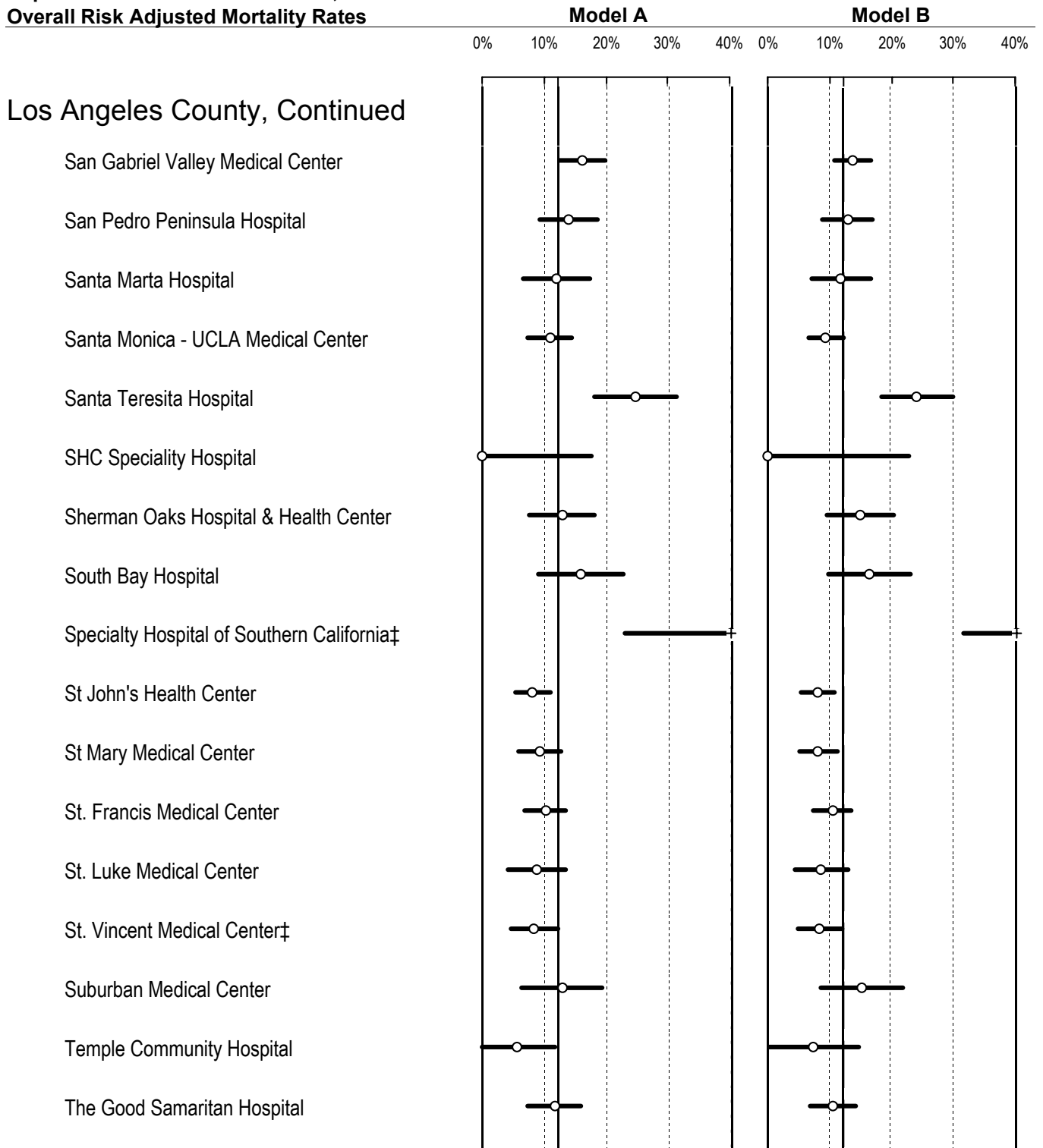


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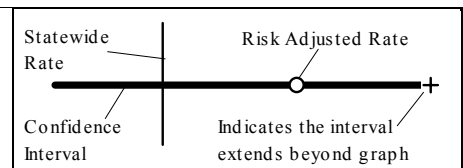


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

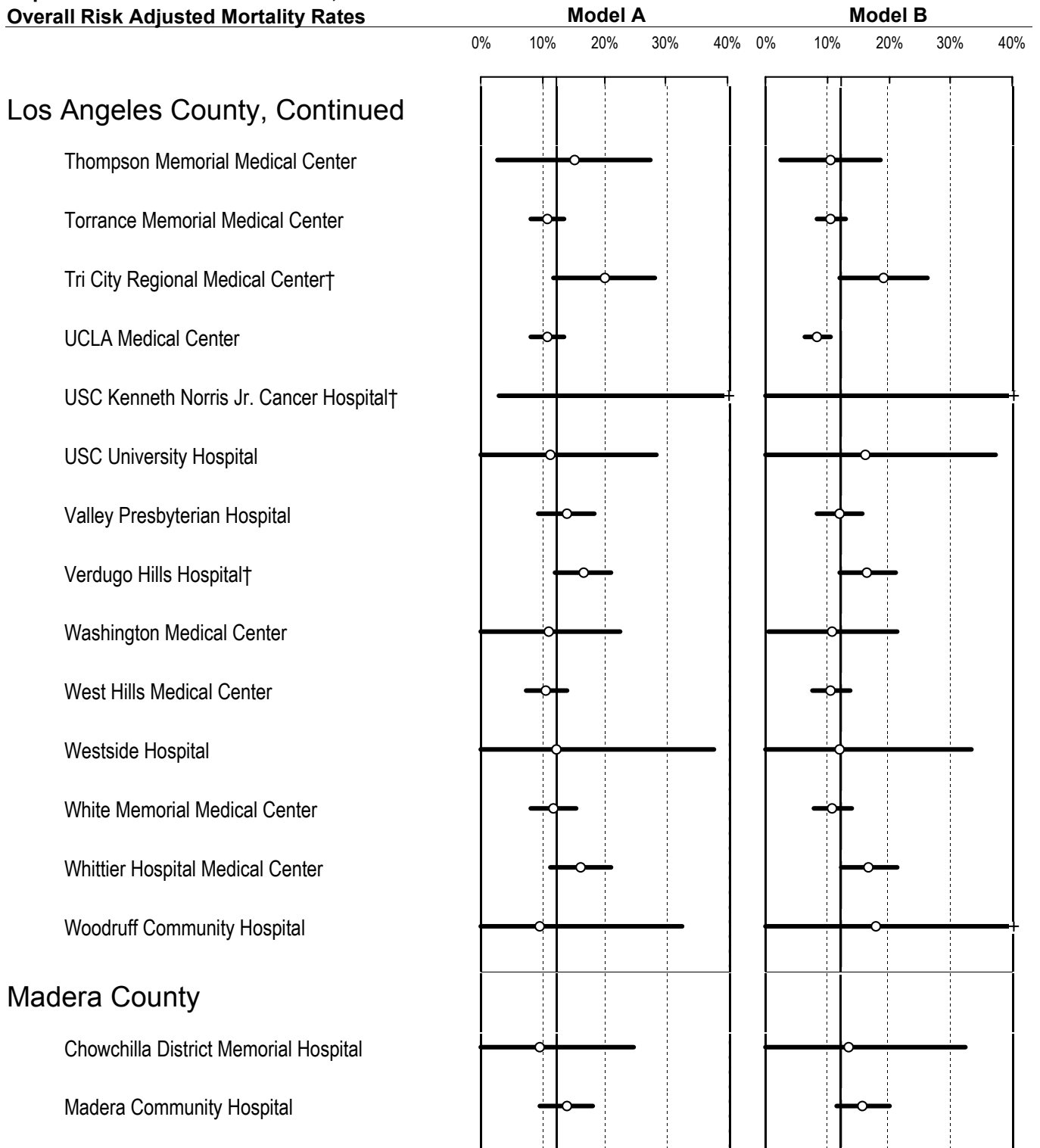


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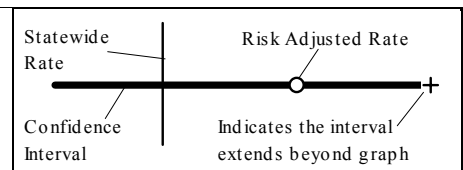


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**



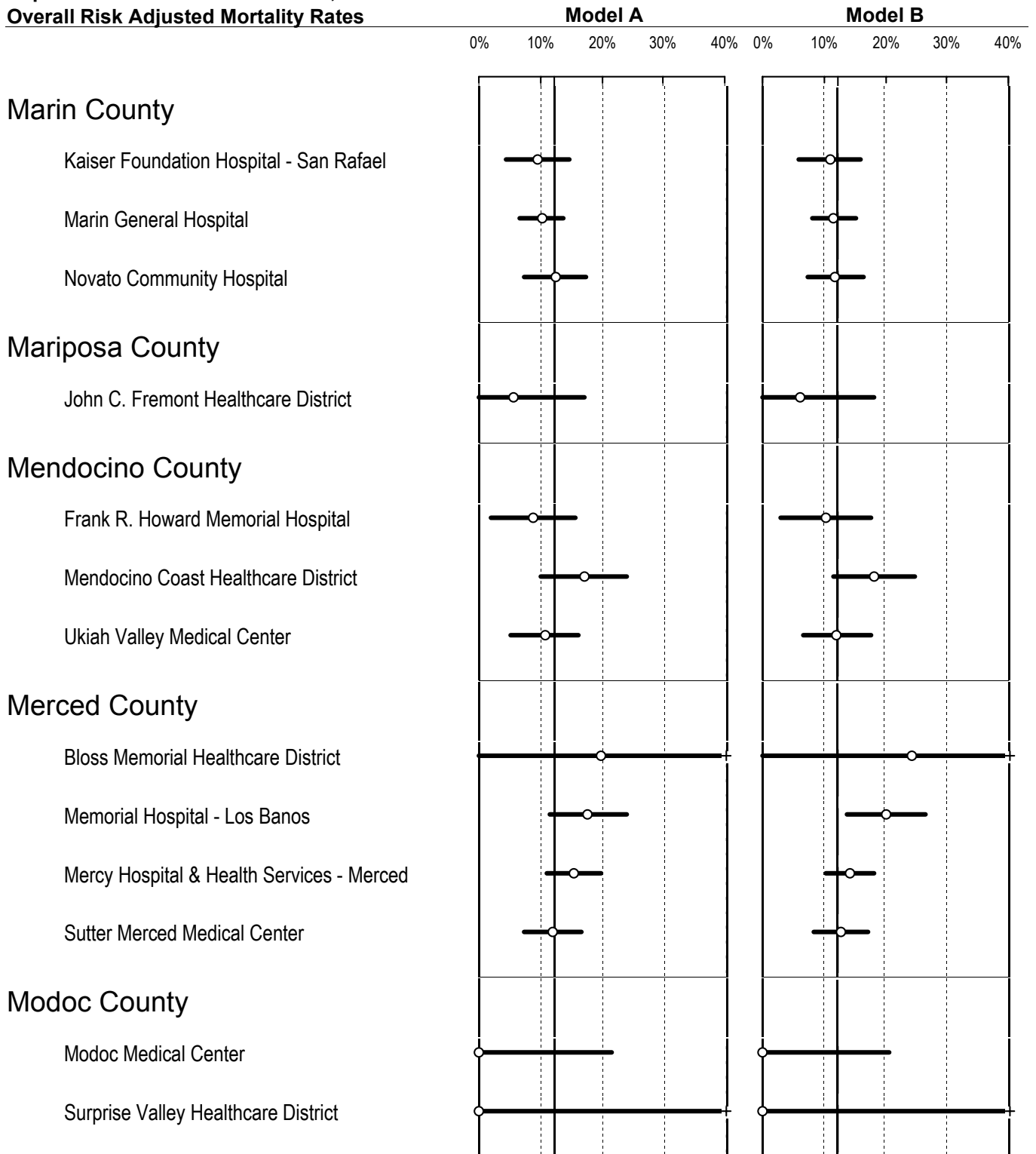
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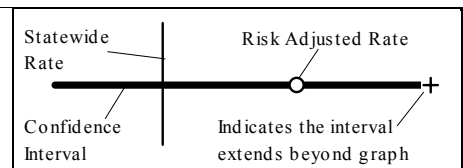


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

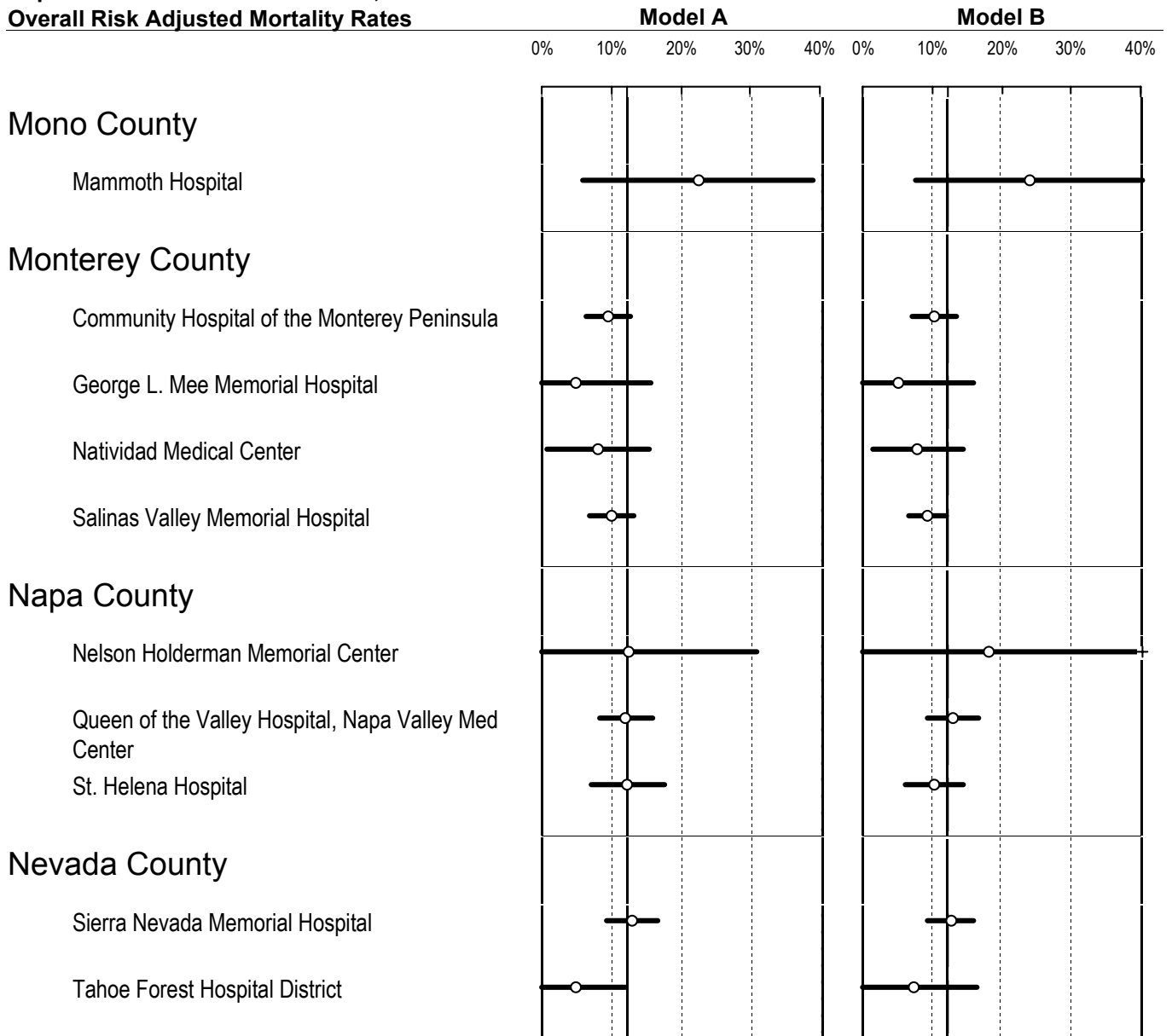


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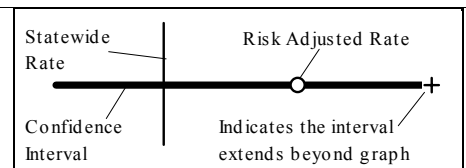


**Report on Heart Attack Outcomes, 1996-1998**  
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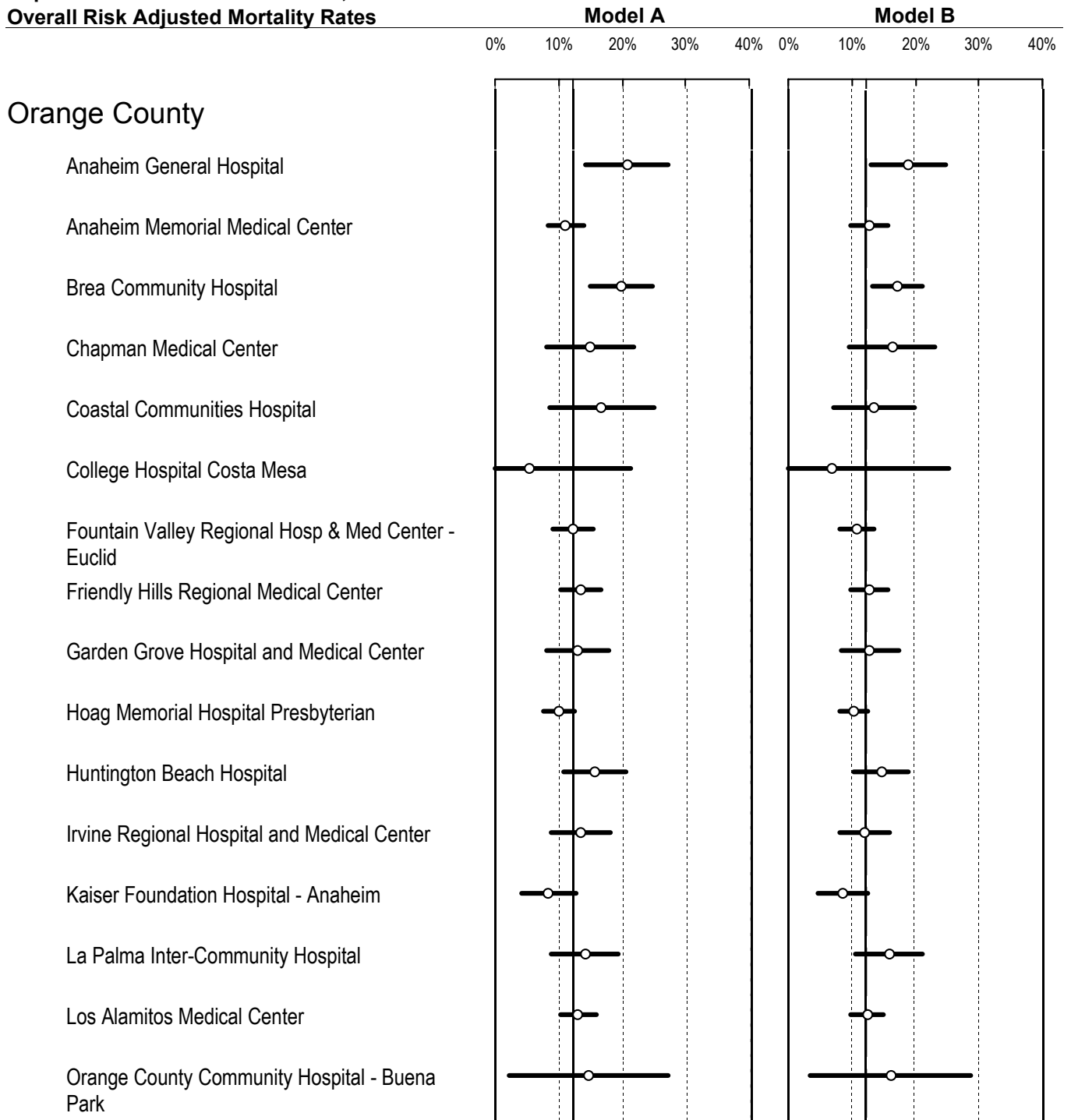


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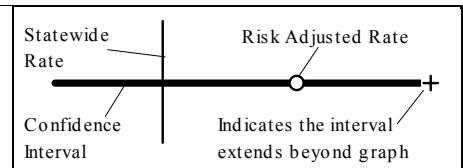


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

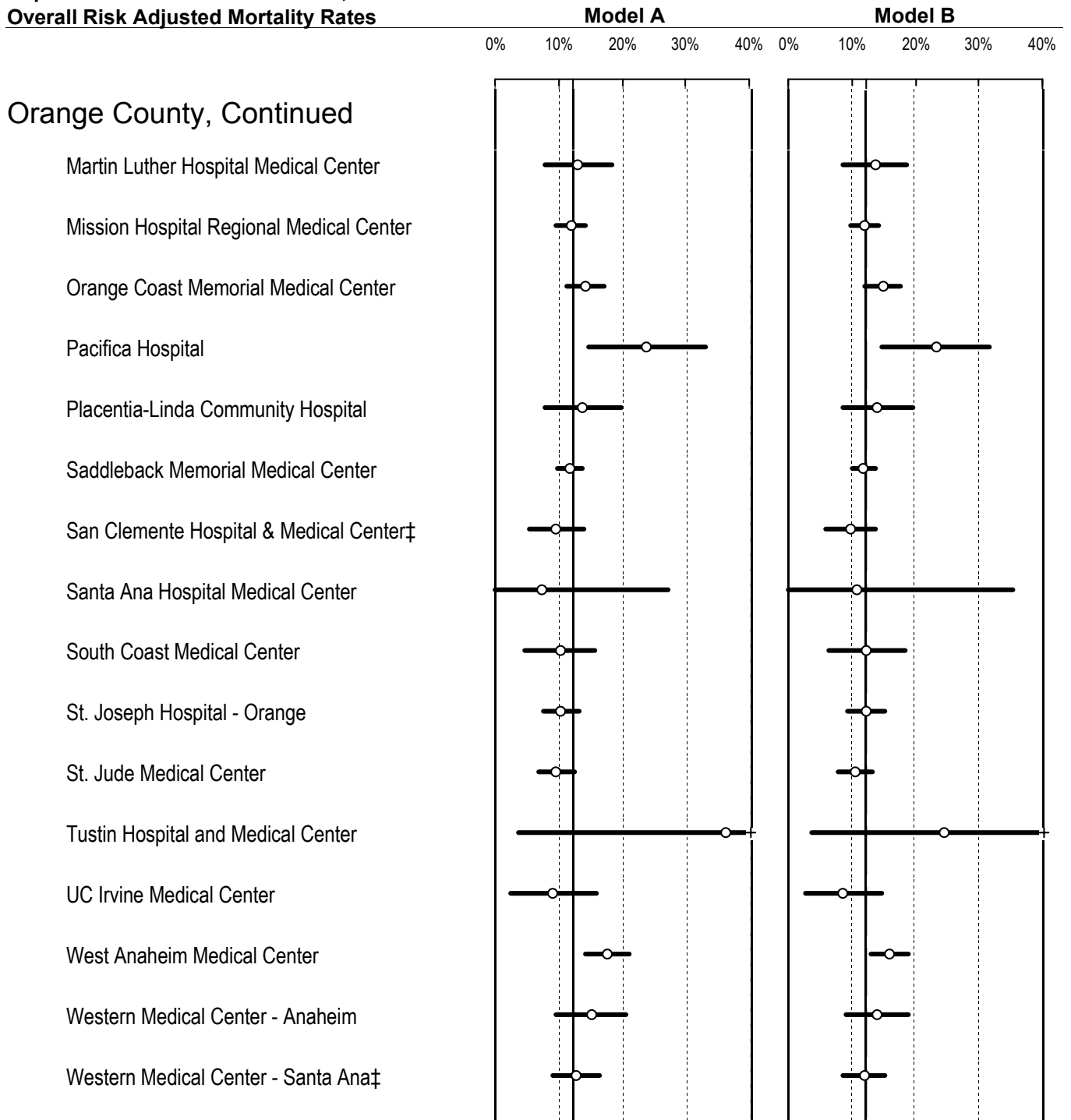


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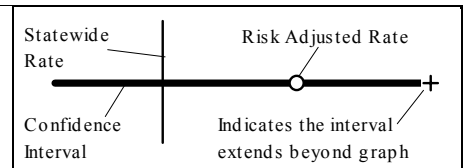


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

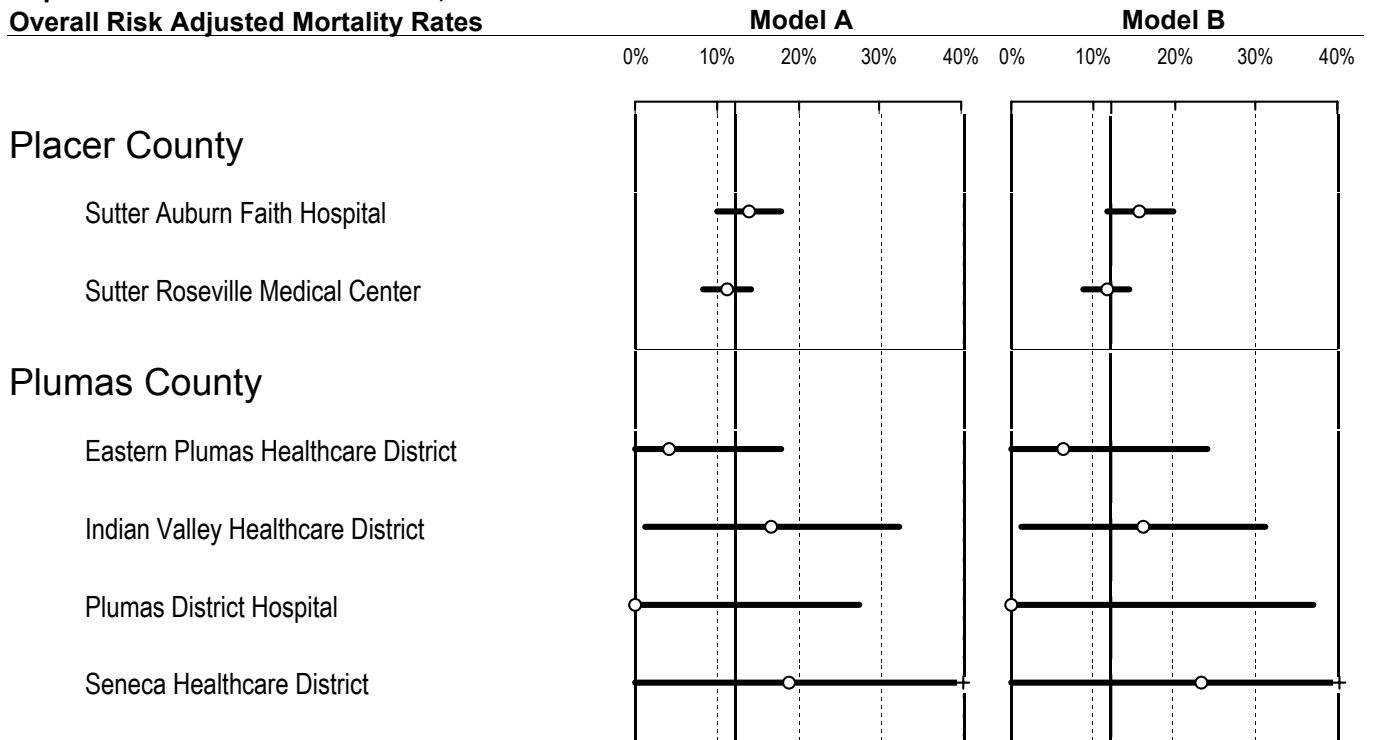


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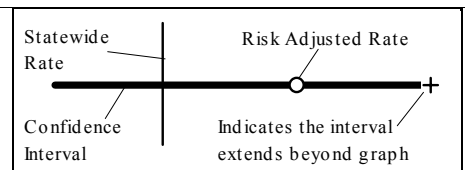


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

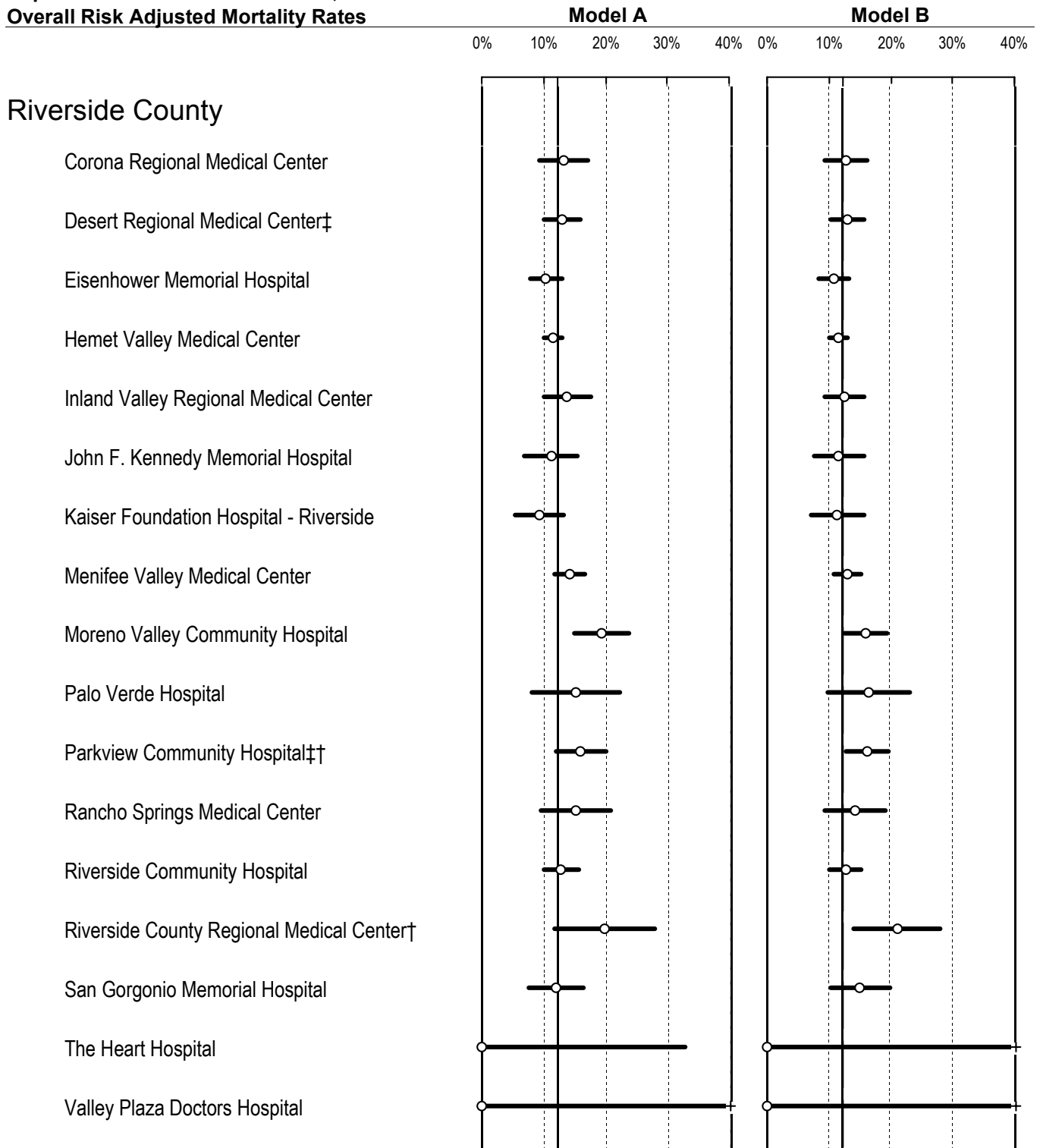


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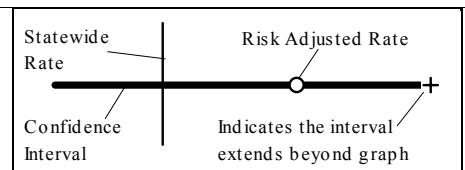


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

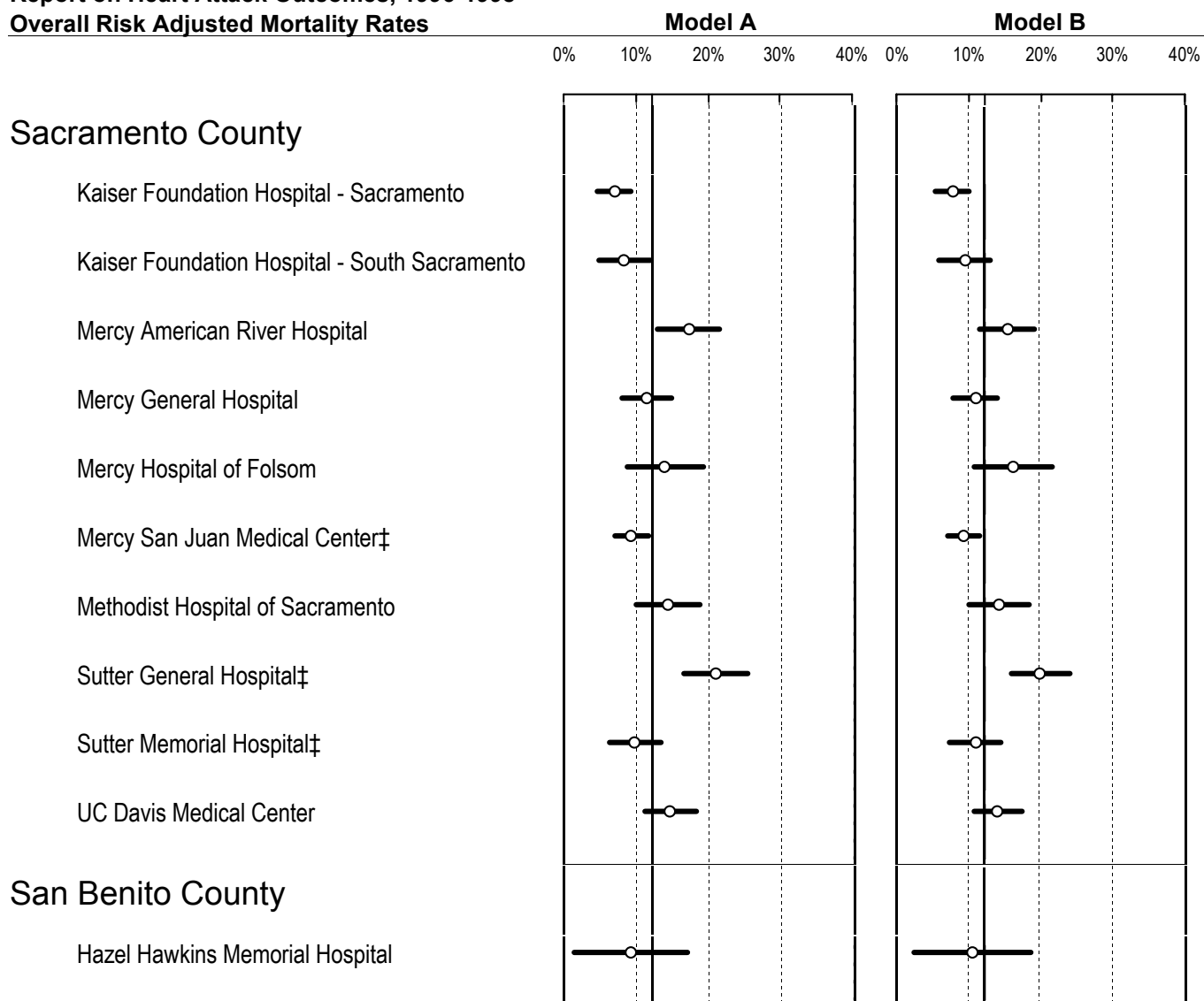


‡ Hospital sent comment letter.

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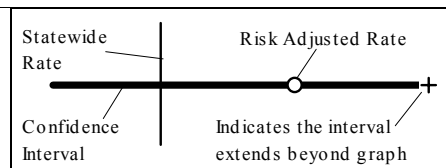


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

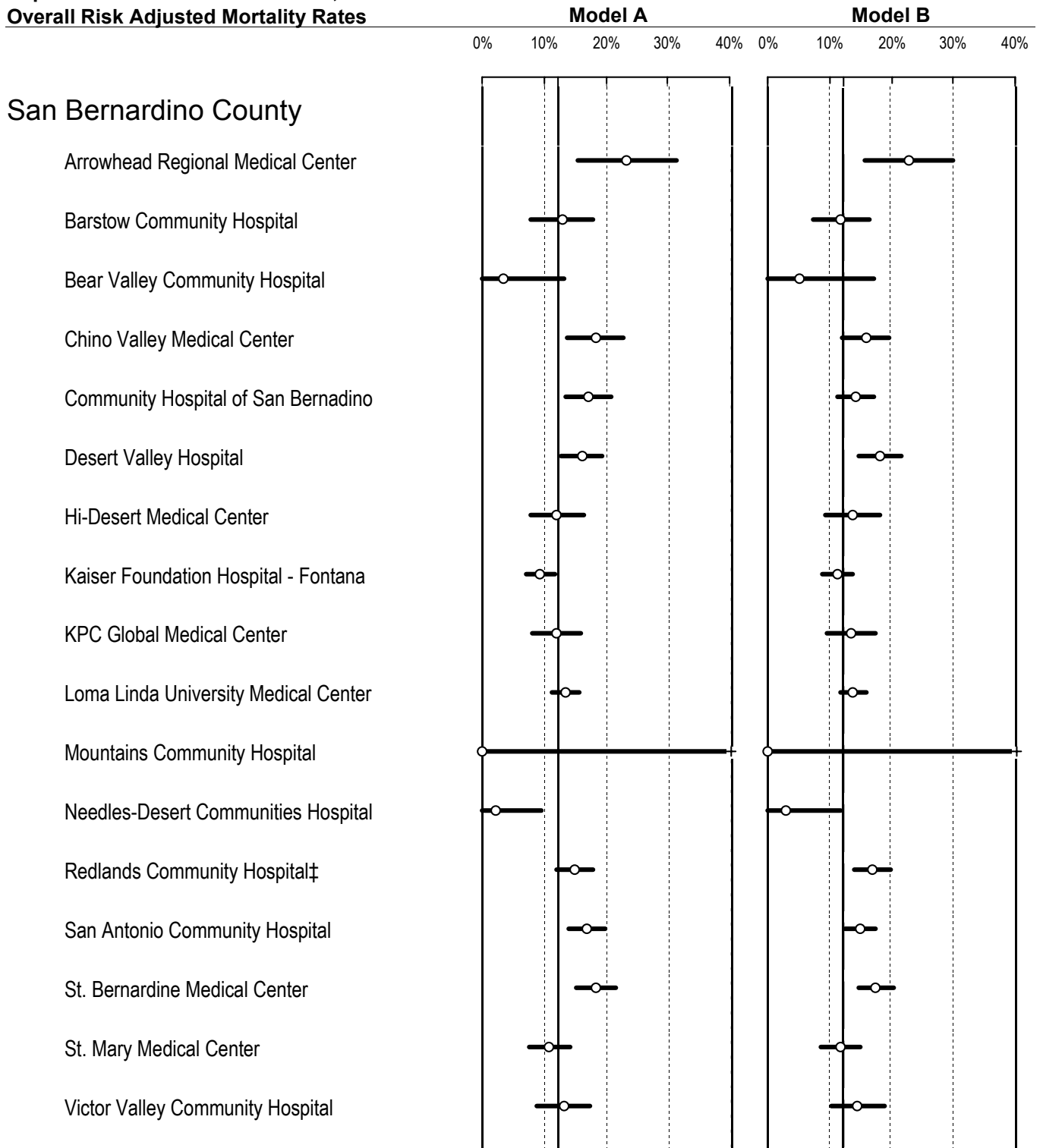


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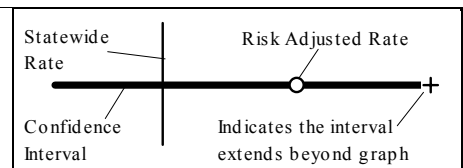


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**



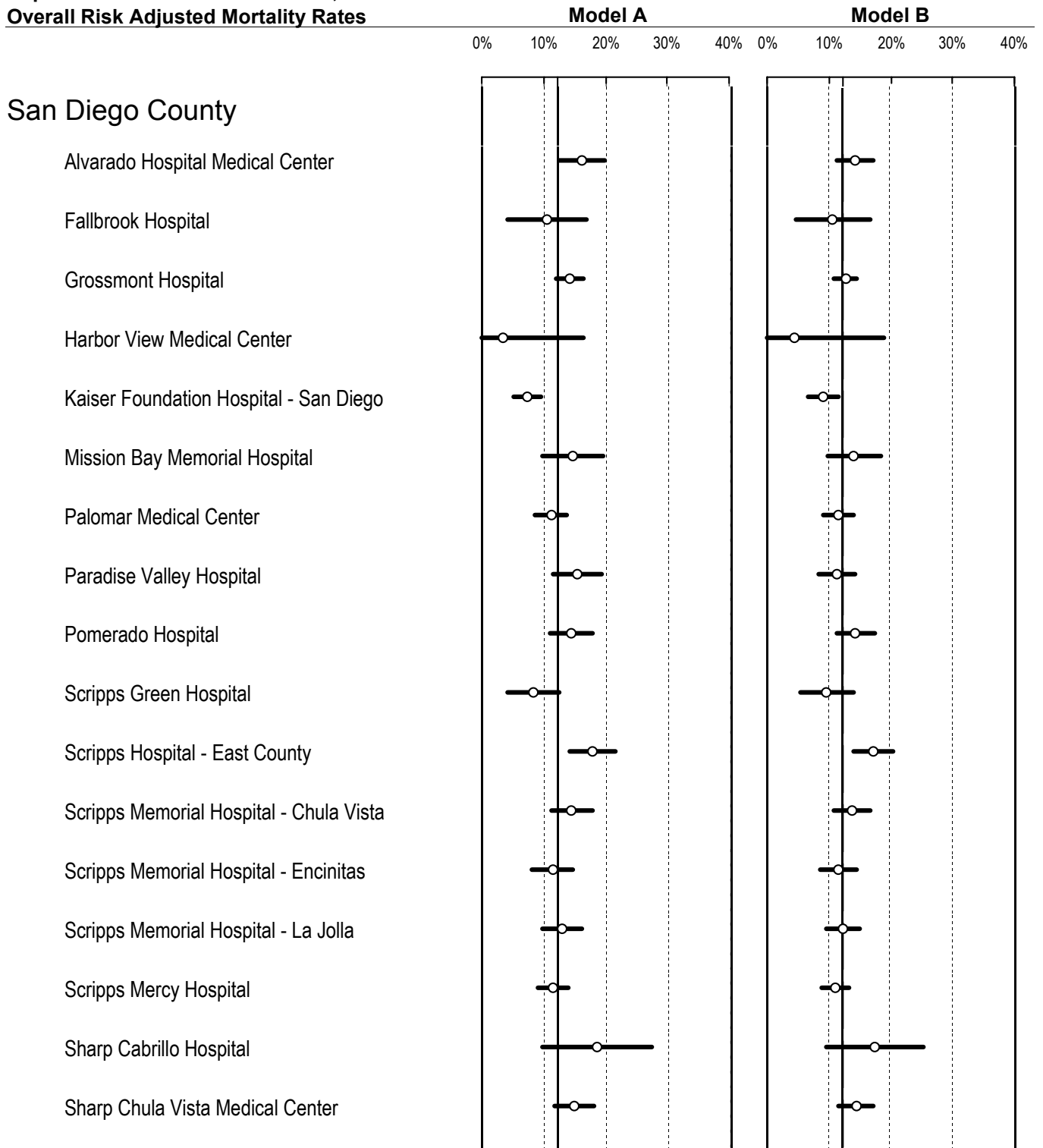
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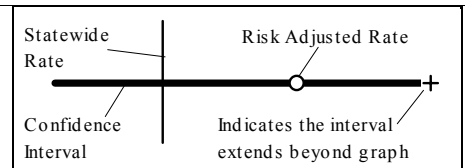


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

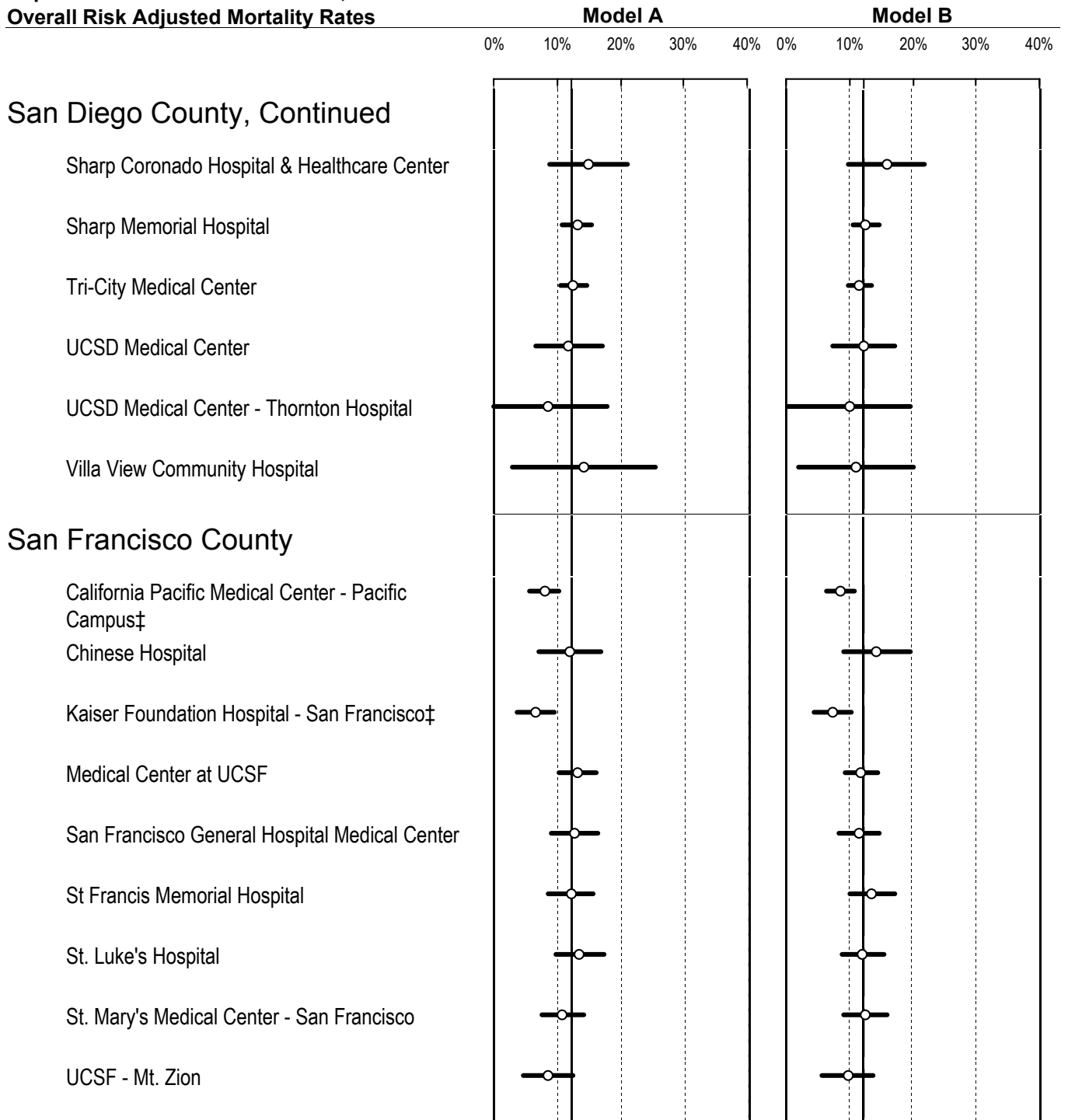


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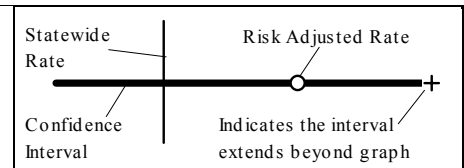


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**Overall Risk Adjusted Mortality Rates**

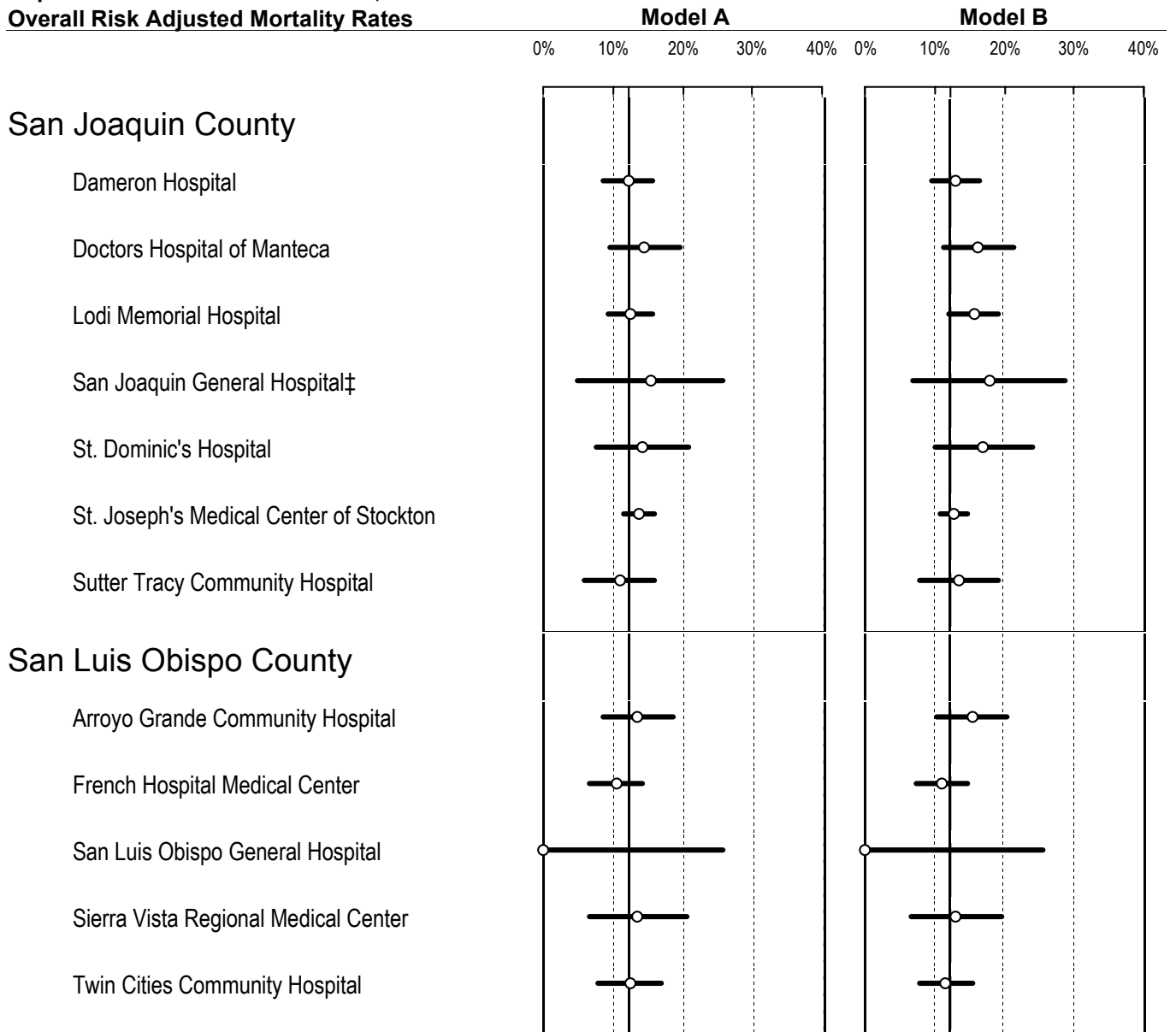


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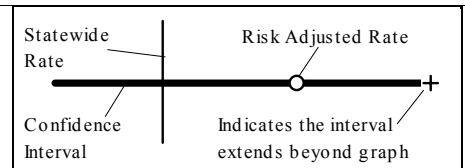


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

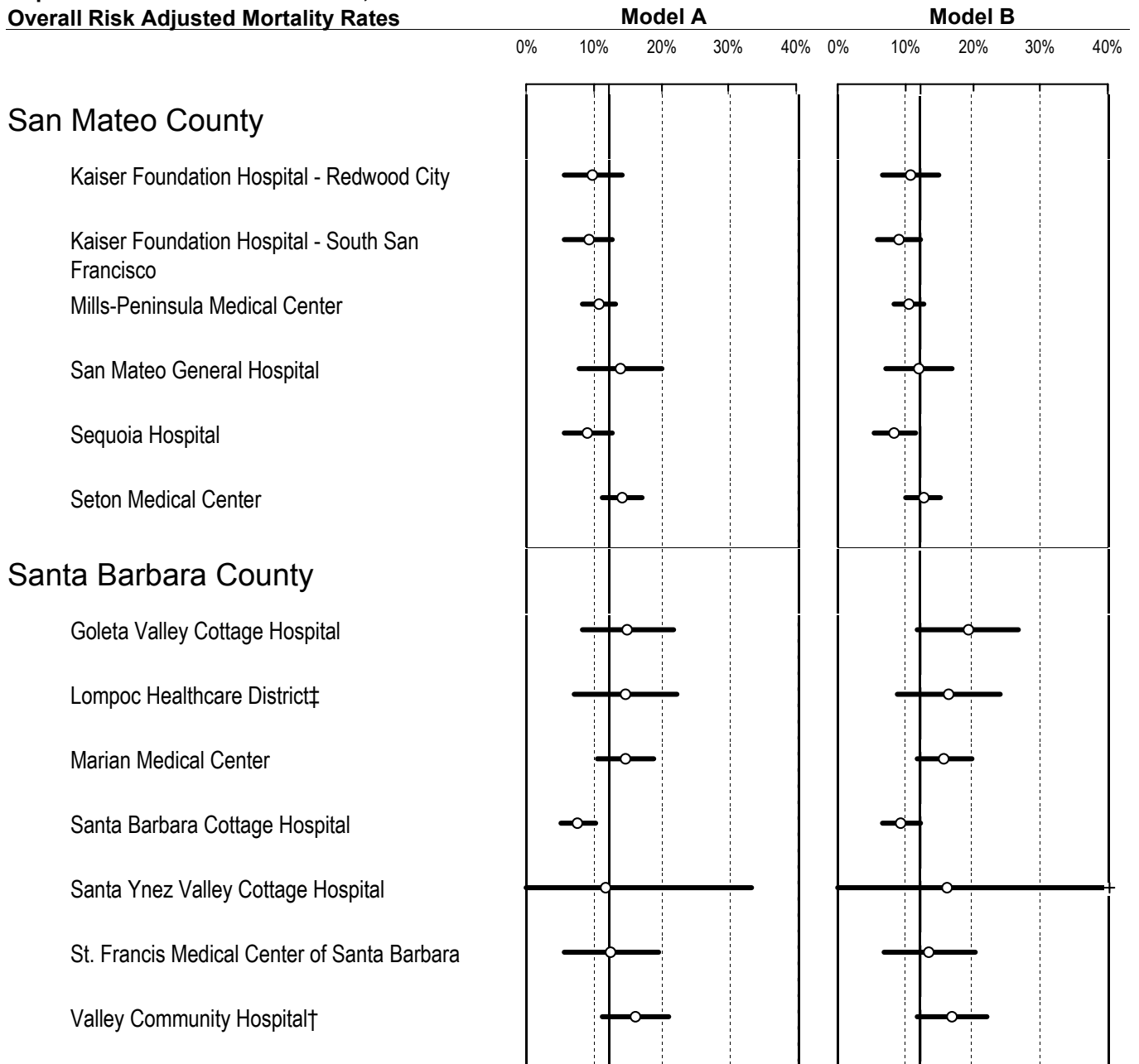


‡ Hospital sent comment letter.

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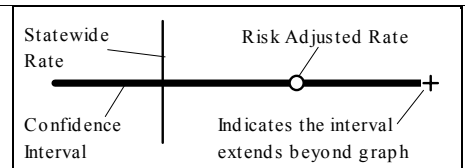


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

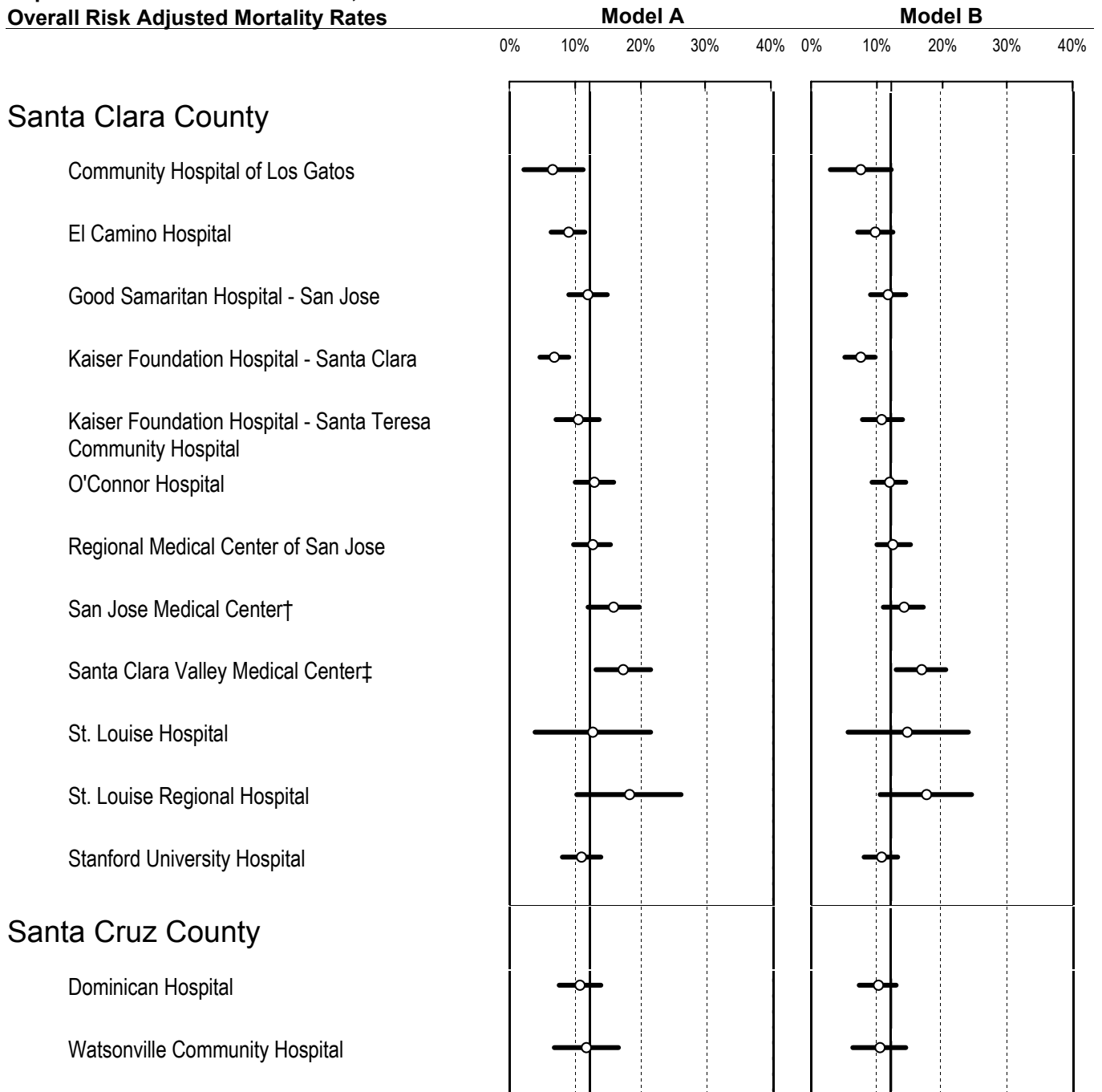


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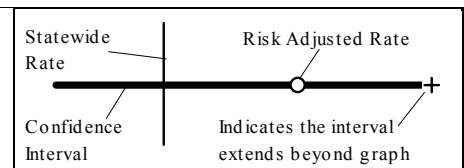


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

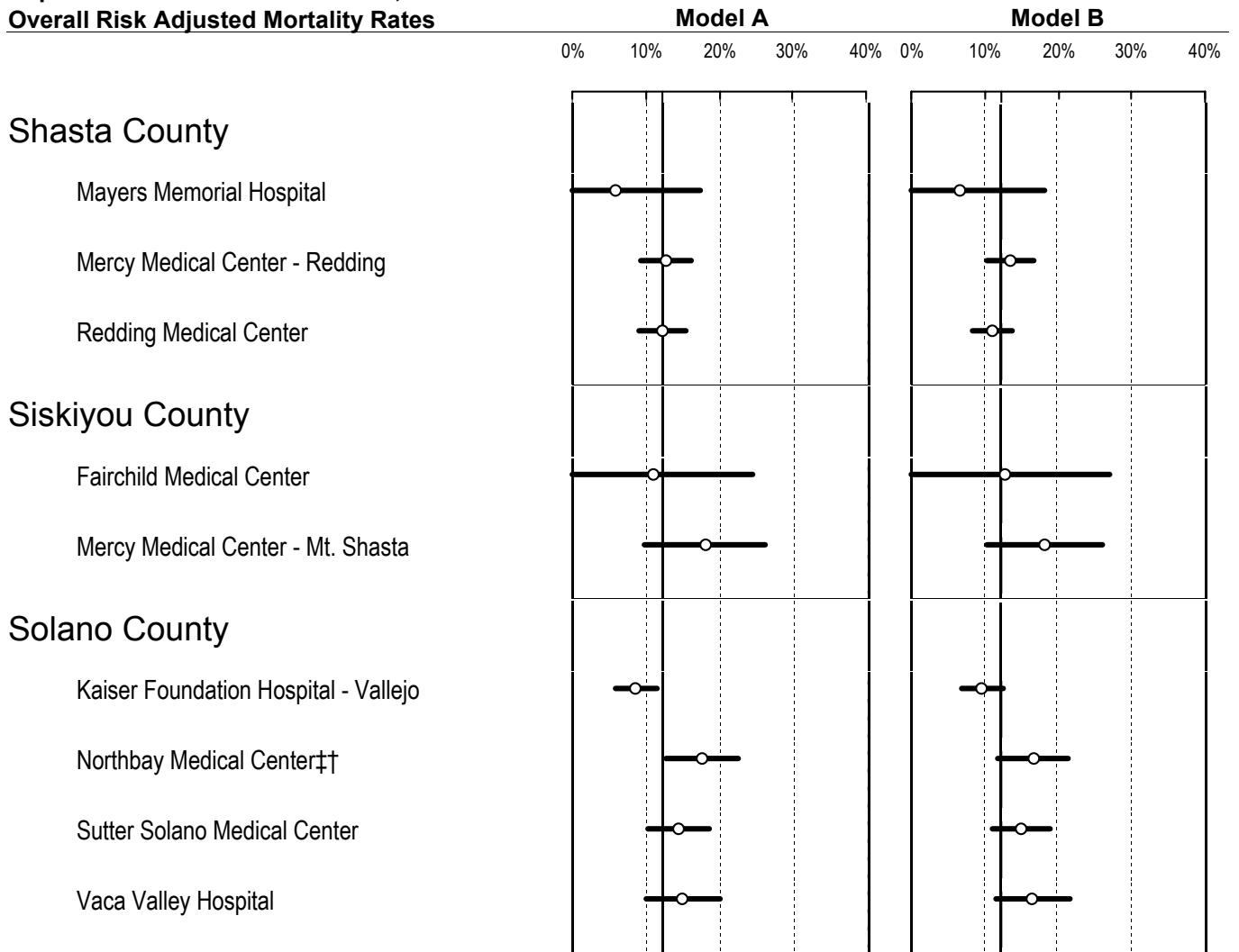


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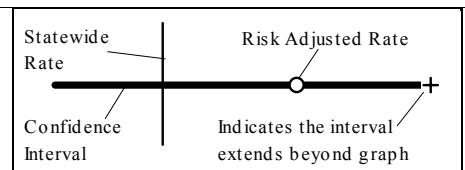


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

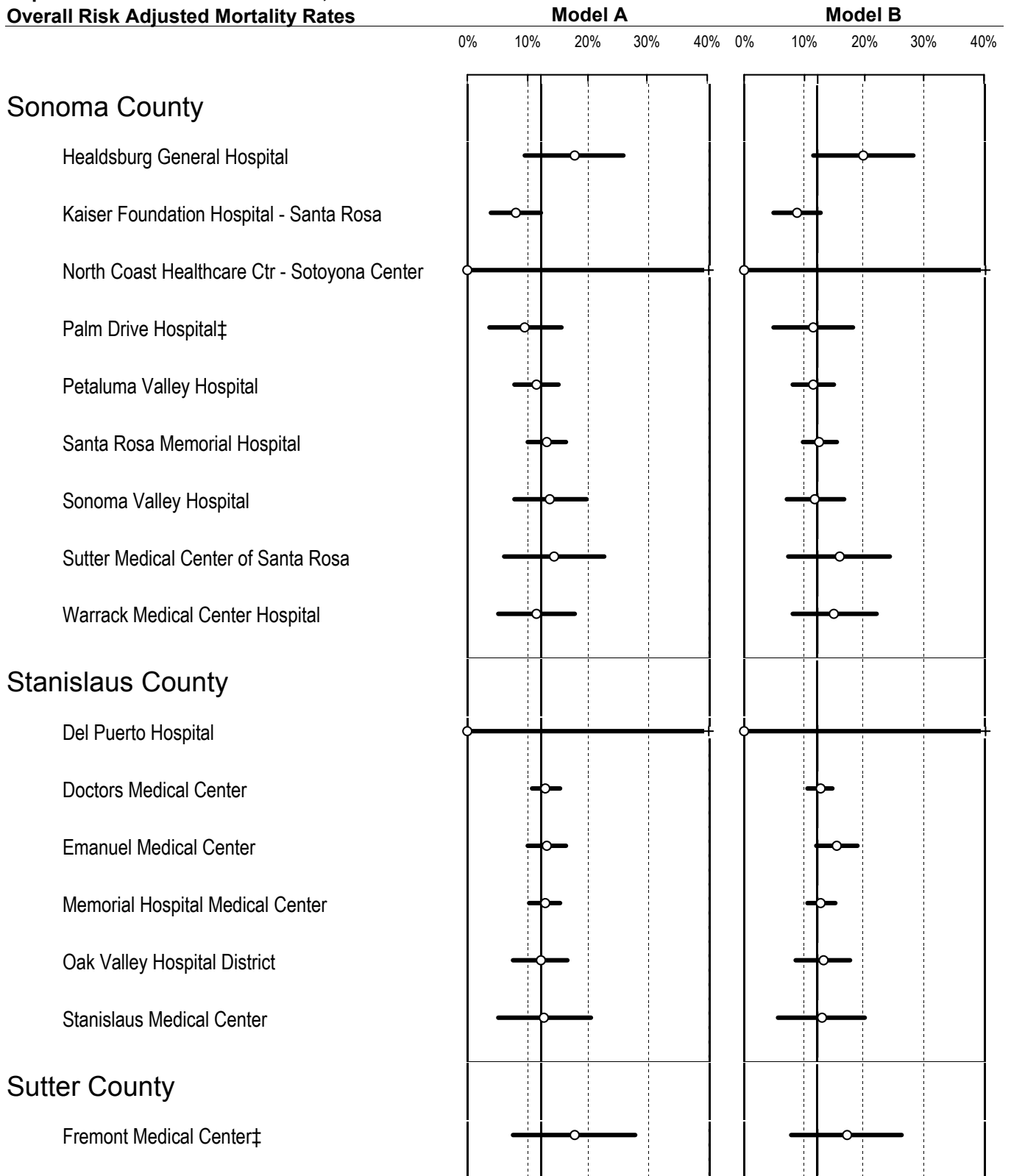


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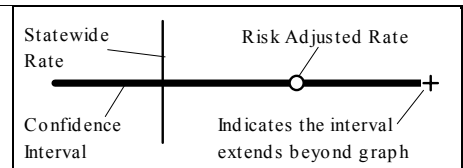


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**

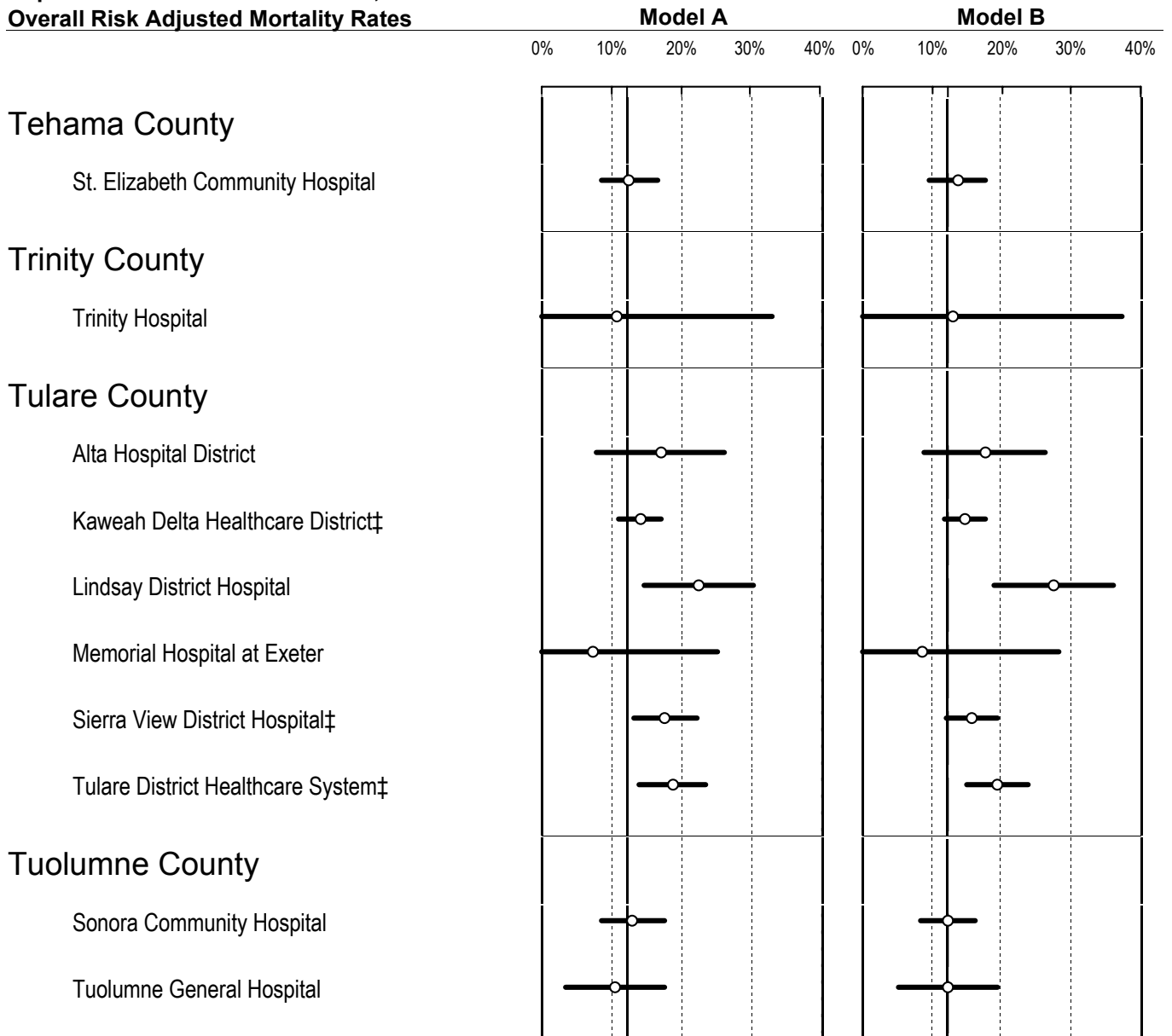


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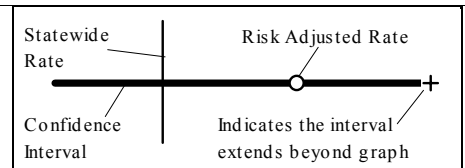


**Report on Heart Attack Outcomes, 1996-1998**  
**Overall Risk Adjusted Mortality Rates**



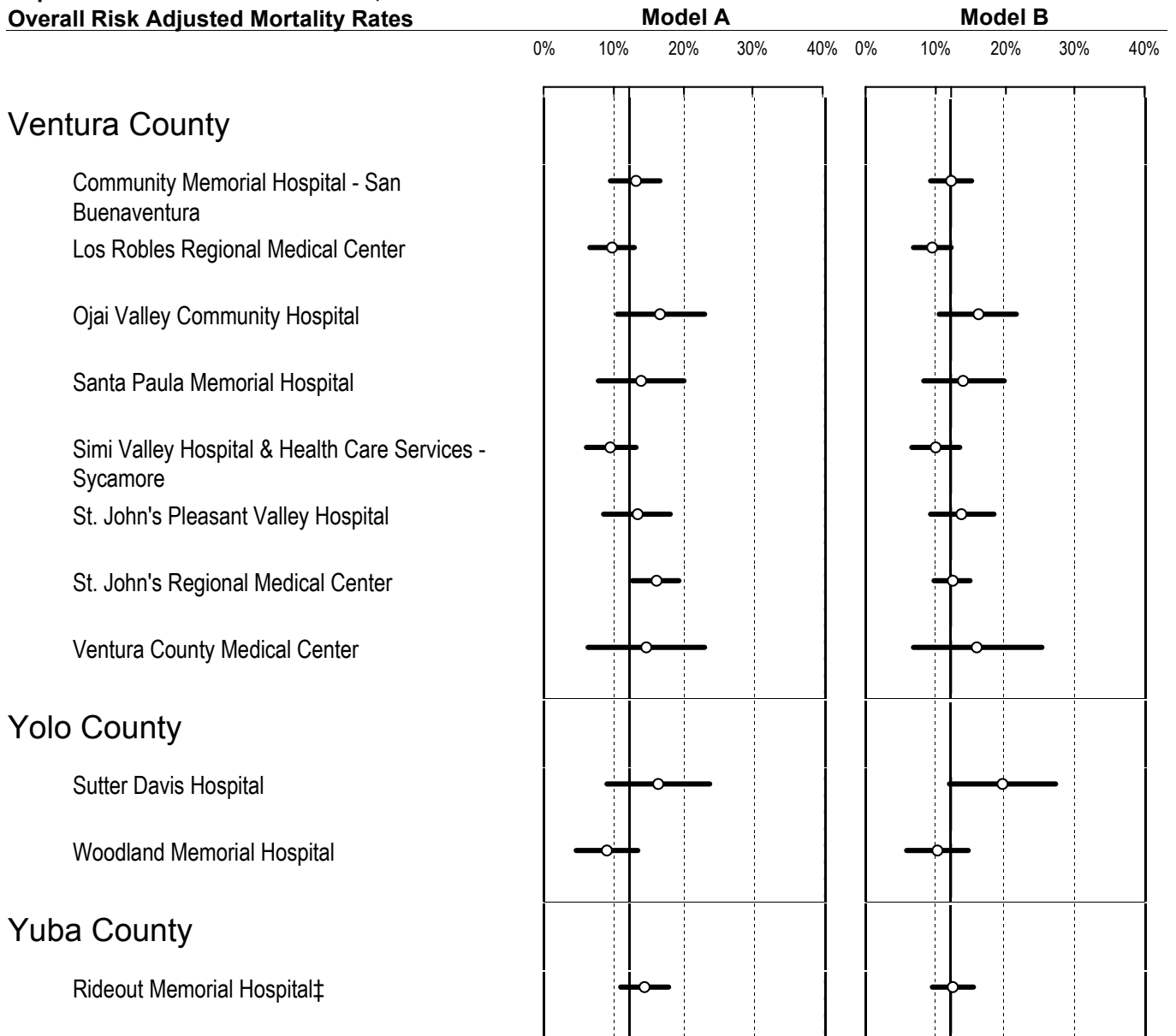
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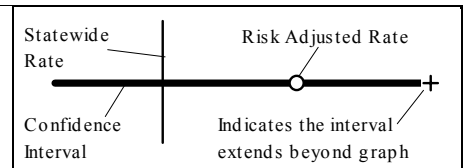


**Report on Heart Attack Outcomes, 1996-1998**  
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‡ Hospital sent comment letter.

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## Appendix

# Additional Sources of Information About Quality

Bay Area Consumers CHECKBOOK  
52 Sylvan Way  
Oakland, CA 94610  
(510) 397-8305

Rates the quality and prices of local service firms ranging from auto repair shops to hospitals

California Department of Managed Healthcare  
980 9th Street Suite 500  
Sacramento, CA 95814  
1-888-HMO-2219  
[www.dmhca.ca.gov](http://www.dmhca.ca.gov)

Licenses HMOs that meet specific standards

California Medical Review, Inc.  
1 Sansome Street, Suite 600  
San Francisco, CA 94101-4448  
(415) 677-2000  
[www.cmri-ca.org](http://www.cmri-ca.org)

Reviews quality for Medicare program, which includes conducting the Cooperative Cardiovascular Project in California to assess hospital's use of specific AMI therapies

California Public Employees Retirement System  
400 P Street  
Sacramento, CA 95814  
(916) 326-3000  
[www.calpers.ca.gov](http://www.calpers.ca.gov)

Publishes a report card on health plans

Joint Commission on Accreditation of Health Care Organizations  
One Renaissance Boulevard  
Oakbrook Terrace, IL 60181  
(630) 792-5000  
[www.jcaho.org](http://www.jcaho.org)

Accredits hospitals that meet specific standards

National Committee on Quality Assurance  
1350 New York Avenue, NW Suite 700  
Washington, DC 20005  
(202) 628-5788  
[www.ncqa.org](http://www.ncqa.org)

Accredits health plans that meet specific standards

Pacific Business Group on Health  
33 Montgomery Street, Suite 450  
San Francisco, CA 94105  
(415) 281-8660  
[www.healthscope.org](http://www.healthscope.org)

Works to improve the quality of health care for its 2.5 million represented employees, dependents, and retirees

U.S. Agency for Healthcare Research & Quality  
2101 E. Jefferson Street, Suite 501  
Rockville, MD 20852  
(301) 594-1364  
[www.ahrq.gov](http://www.ahrq.gov)

The federal government's lead agency supporting research to improve quality of health care